

AMERICAN VETERINARY REVIEW.

FEBRUARY, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, DECEMBER 15, 1912.

ECHOES OF COMPARATIVE PATHOLOGY CONGRESS.—I intended to make a general review of this Congress, but I found the quantity of the material offered, that of the communications presented and of the reports read and discussed, so enormous, that I preferred to limit my remarks to the few subjects concerning principally veterinarians, referring the inquirers to the two volumes which will contain everything which was spoken of at the Congress; and again in my review will refer principally to the conclusions of the various reporters.

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In the section of Parasitology, Prof. A. de Jong, of Leyden, in his report on *Mycosis* common to man and animals has concluded:

1. In the countries where many cases of trichopyty in man are observed, due to a similar disease of cattle and horses, it is recommended to fight these diseases in the animals with official sanitary measures;
2. In countries where skin diseases are common in dogs, specially among loose and erring animals, the diseased ones must be secured by the police, unless the owner can show a veterinary certificate declaring that the disease is not dangerous to man;
3. It is the duty of veterinarians, in cases of trichophyty or

microspory in animals, to take as much as possible all necessary precautions to avoid the infection to man;

4. Veterinarians must also take all necessary measures to avoid the infection of man by faveic animals;

5. Sporotrichosis being observed as cutaneous and subcutaneous mycosis in horses and dogs, the preservation of the health of man demands inquiries upon the frequency of those affections in animals;

6. As it appears possible that among the cases of diseases in horses known as "epizootic lymphangitis" (saccharomycosis, cryptococcosis) and "hyphomycosis destruens," there are cases of sporotrichosis, a disease which can infect man, it is important that the study of these diseases be made over again so as to reach a positive diagnosis.

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The questions of the relations of *aviary and human diphtheria* were also considered by several members of the Congress.

Among the reports presented relating to the subject was that of Dr. Ferdinand Arloing, Professor at the Faculty of Medicine of Lyons. His deductions were as follows:

1. Aviary diphtheria is to-day well known as far as its symptomatology and its clinical forms. It has been differentiated from the other diseases of birds, which present analogous localizations (tuberculosis, mycosis and specially contagious epithelioma);

2. There remain on the contrary, diversities of opinion concerning its etiology; for some it is a parastic or a microbial disease; some attribute it to the diphtheric bacillus of Klebs-Loeffler, or again others make it depend upon specific microbes, different from Loeffler's bacillus, and finally others say that it is due to non-specific common bacilli;

3. From bacteriology, it is right to conclude to a polymicrobial origin of the diseases, Loeffler's bacillus and other various microbes.

4. Pathological anatomy would allow without doubt the veri-

fication of the data shown by bacteriology, according to the cases and the differences between the lesions;

5. All these facts show that in all the cases, there is no unity of cause between human and aviary diphtheria;

6. In the present condition of the question, it is shown by clinical observations that reciprocal contagion is possible between animal and man and that pseudo-membranous sore throats may occur;

7. When animals and particularly fowls are affected with diphtheria by Loeffler's bacillus, they may become for man the cause of a true diphtheria.

8. To the point of view of hygiene and prophylaxy, inter-human contagion must always be considered as the capital cause of diphtheria in our species, but we also think that ought to be considered as contagious for man all pseudo-membranous affections, diphtheretic or not, of fowls and that all necessary preventive and curative measures ought to be taken.

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RABIES.—Rabies was evidently a disease which was to occupy the attention of congressists and to call for many reports. Besides those of Prof. Babes, inexhaustible document of great value, of Prof. Remlinger and others, there is one from Dr. (Mrs.) Luzzani Negri on the etiology and diagnosis of rabies, which can be resumed as follows:

It is known that for quite a long time Dr. Negri has demonstrated the existence in the nervous system of rabid animals of peculiar granulations which are commonly designated as the corpuscles or bodies of Negri.

Those are nothing else than the specific parasite of rabies, so much so that it can be firmly said that, by the simple fact of the demonstration of this parasite, we have a sure and quick means of diagnosis of rabies, a means which includes and presents all the advantages that have often been asked unsuccessfully from the other methods used to this day. To the biological proof of the inoculation in animals, one can indeed substitute the research

of the Negri bodies in all the cases of positive data, with the advantage of rapidity and allowing the examination in even bad conditions of conservation. In all cases, without exception, it may take the place of the microscopic proof and of the searching for the lesions of Gehuchten and of Nelis. It is true that this last is quicker than the biological method, but it is also true that it is a longer and more difficult method than that of searching the parasite; besides, it requires organs in a good state of conservation; and at any rate has not an absolute specific value, the same alterations being likely to be met in other diseases of man or animals and even in old normal dogs.

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TUBERCULOSIS has also occupied the attention of the Congressists. From among the reports I merely resume that of Director H. Vallée of Alfort, on the *road of entrance of Koch's bacillus in the organism of different species*, a question which has given rise already to many discussions and experiments and which seems to be settled now.

For a long time it has been known that it is sufficient for the existence of a first bacillar centre, to see the infection develop, with a variable type or different localization.

But how is that first centre formed? What is the entrance door of the bacillus?

As an ordinary rule it is admitted that this entrance takes place by three great roads: pulmonary, intestinal, bucco-pharyngeal.

The importance of each one is different but their reality is not doubtful.

Recognized since the first experiments of Villemin and of Koch, the facility of the transmission of tuberculosis by the air passages was first discussed. The more recent experiments of Chausse have established without doubt that for the future the capital role of the inhalation of germs in the production of pulmonary tuberculosis must be admitted.

In relation to the infection by the digestive tract, various opinions have been advanced.

As early as 1868 Chauveau proved that tuberculous infection always follows when the digestive canal is used as a road for contagion, when tested in bovines. At present this is denied by some—the difference being explained by variations in the conditions of the experiments.

If indeed the possibility of the intestinal infection cannot be denied, the conditions deserve discussion. The success of the infection depending on the choice of the germs, their state of division at the time they are taken in, the age of the animals, etc.

For the bucco-pharyngeal infection, although it is less frequent, it is not doubtful.

The frequent presence of the bacillus of Koch in the nasal cavities and upon the amygdalæ is a serious basis to this conception of the contagion in this way.

To resume, outside the accidental modes of infection, by cutaneous abrasions, traumatisms, contamination of a wound, physiological conditions permit the entrance of the bacillus of Koch, through the air passages, the digestive tract, and the bucco-pharyngeal region.

But if the entrance of the bacillus can equally take place by either of these ways, the condition of life of the different species give to each of these modes of infection an unequal importance. Contagion by inhalation has a predominating action in the infection of man and of bovines kept in permanent stabulation. On the contrary, it is ingestion which gives rise most commonly to tuberculosis in the other animal species and in bovines kept in common pastures or that go to public drinking places.

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INTRA-BRONCHIC AND INTRA-PULMONARY INJECTIONS.—Is this a new open field of treatment applicable to diseases of the respiratory apparatus and if since several years intra-tracheal injections have been resorted to with a therapeutic object by Prof. Levy of Italy, yet they have not entered the domain of extensive

application. It is true that injections of small quantities have been made, but still there were unbelievers of the good to be obtained and of the possibility of the penetration of the injected



FIG. 1.—Lungs, showing penetration of colored liquid on the surface of the pulmonary tissue, in its thickness, in intertracheo-bronchic lymph glands. (Dog received 10 c.c. of blue of methylene and killed 15 minutes after the injection.)

liquid into the lungs and of their tolerating large quantities of liquids.

If, as Drs. Guisez and G. Stodel have done, with a special syringe, with long canula, having its end pierced with holes, like a watering pot, introduced through the mouth of dogs under the influence of morphine or chloroform, intra-bronchic injections are made of coloring matters, of subnitrate of bismuth, allowing radioscopy and radiography, what are the results?

First. *Injections of Coloring Matters.*—Blue of tolindine in suspension in oil injected can be seen as having penetrated in the entire aerial tree.

If 10 c.c. of such solution at 1 per cent. is used and the animals killed after 15 and 30 minutes, 24 and 36 hours, in what conditions are the lungs found?

After 15 minutes the respiratory tree is entirely injected and isolated spots of colored surfaces are observed (Fig. 1).

After 30 minutes the external coloration is more marked and is nearly complete after an hour (Fig. 2.)

After 24 to 36 hours the bronchia and their ramifications are still colored and the pulmonary structure is colored with large spots plainly seen (Fig. 3.)

Second. *Injections of Subnitrate of Bismuth.*—If an injection of 10 to 20 c.c. of oil holding in suspension subnitrate of bismuth in proportion of 60 per cent. is made, radioscopy is perfectly clear, better than radiography, yet 48 hours after

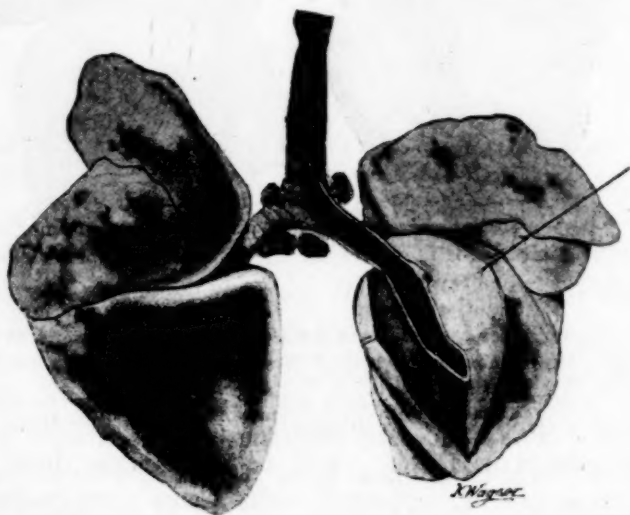


FIG. 2—Showing the penetration of coloring substances: (1) on the surface of the lungs; (2) in the mediastine lymph glands. (Dog was injected with 10 c.c. of blue of methylene and killed 30 hours after.)

the observation radiography reveals the presence of the bismuth in the intestine.

During the experiment, the dogs evinced no trouble of the respiration, which remained normal. Death occurred in them with toxic-gastro-enteritis, between six and twelve days after the injection.

These experiments show that by this method the pulmonary

apparatus can be injected with perfect safety and also the entire parenchyma can be impregnated.

To the point of view of therapeutic applications, the experiments have shown that administered by the trachea, the

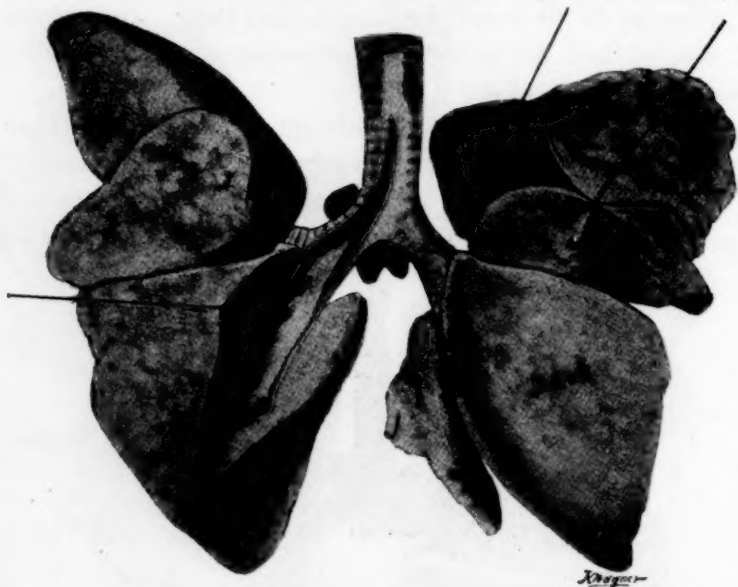


FIG. 3—Showing the penetration and diffusion of the coloring matter on the surface of the lungs. (Dog had received, at 24 hours apart, two injections of 10 c.c. of blue of methylene and was killed 24 hours after the second injection.)

contact of a drug with the lung tissue lasts longer than if given by intra-venous injection. And, besides, larger doses of blue of methylene can be supported without any complication when given by the trachea, while it would prove fatal if given through the veins.

Now what are the practical applications of this new therapy?

As active solutions, there were used gomenol in oil from 5 to 10 per cent. and gaiacol in oil at 5 per cent.. Iodoform was sometimes added to the oil, or again 5 per cent. solutions of argyrol.

In tracheal and tracheo-bronchial affections improvement was rapidly manifested and radical recoveries after eight or nine injections.

Five cases of tracheal ozena were radically cured. Three cases of broncho-pulmonary infection following the presence of intrabronchic foreign bodies, ten cases of bronchial dilations. All were benefited by this mode of treatment. And even in pulmonary gangrene the results were peculiarly brilliant. Experiments have also been made with pulmonary tuberculosis in which the results were less satisfactory.

Those applications may not all find their indications in veterinary practice and yet there are probably conditions where their trials might be justifiable. Could not chronic bronchial affections and even pulmonary gangrene be among them?

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SUPPURATIVE KERATITIS.—This affection is one which is quite frequently met with, specially in dogs, and as complications of infectious diseases of the cornea, they are often the cause of much trouble to the attending surgeon. Professor Dr. J. Baudry has called attention to the treatment of this disease which deserves publicity, says the *Presse Medicale*.

The use of the tincture of iodine as disinfecting, and caustic in cases of corneal ulcerations and abscesses gives always satisfactory results, which sometimes are wonderful. With a very fine hair brush dipped in a small quantity of tincture, the centre of the ulceration is slightly touched after cocainization of the eye. The iodine spreads round the spot with which it has just been in contact and penetrates some in the infiltrated surrounding region. Instead of the brush, a fine probe with a little hydrophilous cotton or a glass rod can be used to make the application. Even if these have been made several times, no inconvenience results. A positive contra-indication is not to use mercury salts at the same time as the iodine. As there will be formed a precipitate of insoluble mercurial iodine, caustic and dangerous, besides the appearance of excessive pains that nothing can allay.

The action of the tincture of iodine is generally quite rapid;

often two or three applications being sufficient to arrest or remove an hypopyon.

It is only when this mode of treatment fails, by the specific virulency of the microbe, the presence of a suitable soil, or specially a reinfection that an operation, that of Soemisch, is advisable, when extensive prolapsus of the iris exists.

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INTERNATIONAL VETERINARY CONGRESSES.—The celebrations at Lyons have been the opportunity for the Permanent Committee of the International Veterinary Congresses to hold a meeting. It was on the twenty-fifth of October, 1912, when nineteen out of the twenty-four members answered to the call of Dr. Lydtin, the president of the committee. These were Dr. Bang, of Denmark; Barrier, of France; Hauka, of Austria, representing Dr. Binder; Professor Degive, of Belgium; Hapich, of Russia; Heiss, of Switzerland; Hutyra and de Ratz, of Hungary; de Jong and Schimmel, of Holland; Kjerrulf, of Sweden; Locusteanu, of Roumania; Sir John McFadyean and Stockman, of England; Malon, of Norway; Perroncito, of Italy; Piot Bey, of Egypt; Theiler, of South Africa.

The committee was received by Director Faure.

Among the official business of the meeting were a discussion on the definitive acceptance of The Hague as the permanent seat of the committee. Then came propositions made by Sir John McFadyean and Stockman in relation to the organization of the London Congress in 1914. The first week in August being selected, the day to be fixed later on. Sir John McFadyean and Stockman stated that they were assured of contributions amounting to about \$20,000.

The tenth congress will be with the commemoration of the fiftieth anniversary of the foundation of the International Congresses.

A national committee of propaganda is to be organized by every member of the permanent Commission, one in each country.

The program of the International Congress will be published at an early date.

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PRACTICAL TREATISE OF HORSESHOEING (*Traité Pratique de Maréchalerie*) by Mr. J. Tasset, professor of horseshoeing at the cavalry school of Saumur, published by J. B. Bailliere & Son, 19 rue Hautefeuille, Paris.

This little volume of 480 pages is addressed to blacksmiths, veterinarians, horsemen, etc., and is written well up with all new scientific data and practical applications.

After a concise review of the history of horseshoeing and the origin of the use of nails to hold the shoe, the author considers the anatomy and the physiology of the foot, which gives him the opportunity to reproduce some excellent plates.

The shop of the blacksmith, with its various tools and the essential material used, occupy the third part of the work, which is followed by a study on the shoe itself, its fabrication by hand or machine, that for saddle horses and for draught, light and heavy, that for the army horse and finally that for winter and ice weather, the sharpening of the shoe.

The various manipulations of the shoeing are minutely considered. The special shoeings and their numerous varieties to arrive at the pathological shoes, to those required for defective feet or those appropriated to accidents on horses while in action or at rest, for the horse that stumbles, that forges, that interferes, etc.

Shoeing of mules, donkeys and cattle is also indicated.

The diseases of the foot are also considered, general lameness, contracted heels, corns, laminitis, quittor, canker, seams, etc. A special chapter on the military horseshoeing completes this work.

The 237 plates that illustrate this new book add considerably to the understanding of the descriptions.

A. L.

THE VALUE OF PHYSICAL EXAMINATION AND CLINICAL DIAGNOSIS IN THE CONTROL OF TUBERCULOSIS IN CATTLE.

The above is the title of a paper presented by Prof. Veranus A. Moore, Director of the New York State Veterinary College, to the United States Live Stock Sanitary Association at Chicago, in December last, a copy of which was placed in our hands on Dr. Moore's return from the meeting, and which we have read with more than usual interest, because we were not in sympathy with what we thought the doctor advocated by the title of his paper; we feared that his one-time belief in the value of tuberculin had been shaken; but our reading of the paper has shown us that Dr. Moore stands just where he always has stood since we have known him, in his estimation of the value of tuberculin as a diagnostic agent in bovine tuberculosis. He says in so many words: "There is no question but that the tuberculin test applied to all herds and properly repeated with the slaughter of the reactors would be the quickest way to eradicate tuberculosis." But he also points out further on in his paper that: "It is because of existing conditions in the great dairy districts that it seems desirable to *add* to the more stringent methods that are being applied in a *few* herds some measure to eliminate from *all* herds the cows with recognizable tuberculosis of the lungs, intestines, uterus and udder." Dr. Moore believes that it is the recognizable cases that are the real *immediate* spreaders, and says: "Check the spread of the virus in every dairy herd, should be the slogan of the live-stock sanitarian." While the title of Dr. Moore's paper includes under one heading physical examination and clinical diagnosis, he desires it clearly understood that these are not synonymous terms and should be carefully differentiated; he says: "The term 'physical examination' means the systematic study of the various parts of the animal body by means of the ordinary senses"; and "In applying this method, each system, such as the respiratory or circulatory, is carefully examined in every part possible, so that any deviation from

the normal at any point that can be reached by the human eye, hand or ear can be detected." That naturally raises the question as to whether or not "any deviation from the normal" can be detected, and we do not believe Dr. Moore means that to be taken literally, but rather that advanced abnormalities will naturally be detected on a careful physical examination by an experienced diagnostician. In fact, he covers just such a point further along in his paper, where he says: "The question naturally arises as to the degree of accuracy of such examinations in identifying any particular diseases"; and follows with: "It is clear that a careful examination of the subcutaneous lymph glands would indicate whether one or more of them was enlarged. It would be difficult, in fact impossible, from that indication alone to state the specific nature of the trouble. The same would hold with abnormal findings in other parts. If, however, the morbid changes are well advanced, they usually take on a form that is more or less characteristic of the disease they represent. This is not always true, for not infrequently diagnosis based on such findings proves to be erroneous. There are certain specific diseases, such as tuberculosis, actinomycosis, glanders and some others that can be identified in a very large percentage of cases, when the tissue changes have advanced to a certain stage." And our interpretation of Dr. Moore's paper is that it is the *advanced* cases of tuberculosis that he hopes to pick out from the herds by the system of physical examination that he advocates. And, as he says further on: "The degree of accuracy of such a diagnosis is necessarily determined by the knowledge possessed by the examiner of the course of the disease and the relative frequency of other causes, giving rise to apparently like conditions." Still further along he says: "The diagnosis therefore by physical examination in cases of specific diseases is presumptive. This presumptive diagnosis stands in exactly the same position as other presumptive tests employed in laboratory work." And after giving a number of examples in laboratory tests of water, milk, excreta, etc., the doctor continues: "In a like manner the presence of obvious tissue changes suggestive of tuberculosis

warrant the same degree of consideration as other presumptive tests, which are accepted as sufficient evidence for action." If we have gotten a correct understanding of Dr. Moore's paper, as suggested by the title and our reading of it, in his method for the removal of "recognizable cases" from the herd he does not tie himself down to physical examination, but also includes "clinical diagnosis," which he defines as: "The finding of morbid conditions on physical examination and identifying the disease by any means or test that may be applied to the living animal, such, for example, as microscopic examination of excreta, chemical analysis of secretions or specific reactions." He also adds further along: "It is well, therefore, to recognize that physical examination and clinical diagnosis may be like two variables gradually approaching the same limit." He faces the vital question: "To what extent can tuberculosis be controlled by the use of physical examination only?" and admits its very narrow limitations without confirmation by some of the methods included in clinical diagnosis, already referred to, and adds: "The physical examination in this country should include all that the Germans hope for by the clinical diagnosis. They find the suspicious case on physical examination, and then proceed with methods of precision to make a positive diagnosis. We should remove the suspicious cases, and if they are kept they should be held in quarantine until the positive diagnosis is made. If this were done, the physical examination here would mean all that the clinical diagnosis means in Germany. If this were applied to all herds, it would be a great addition to the present method in eliminating tuberculosis." This last paragraph is conclusive evidence that Dr. Moore is not tied up to the physical examination; he does not advocate taking anything away from our present method, but would add to it the elimination from all herds of the cases recognizable on physical examination as a preliminary measure, and he would follow that with all other means of detecting tuberculosis in cattle, including the tuberculin test. That, at least, is our interpretation of the paper, and is entirely in keeping with the scientific attainment of its learned

author; but what we cannot quite comprehend is, how it is to be accomplished. We will take, for example, the State of New York, where, we understand, such a system has been recommended at a recent conference on tuberculosis as expedient, and will in all probability be offered as an amendment to the present agricultural law. There are in New York State about one million eight hundred thousand milch cows and about nine hundred thousand other cattle; the physical examination of which, even in the most superficial manner, would require the services of a very large force of veterinarians for a considerable time; and to make a careful and thorough examination of them, such as Dr. Moore recommends (and as it should be done, if done at all), will require still longer, to say nothing of the methods of precision that are to follow. Dr. Moore concludes his paper as follows: "It is important to recognize always where the value of a physical examination begins and ends. The following seems to be determined: 1. A physical examination will enable a skilled examiner to detect advanced cases of tuberculosis in cattle. 2. It will enable one to detect the presence of lesions in less advanced cases, so that the *suspicious animals* can be removed. 3. The physical examination will not detect more than from 1 to 5 per cent. of the infected animals at one time. For this reason its value is very largely restricted to the intra-herd control of the disease. 4. A physical examination cannot be relied upon to detect all infected cattle, and consequently it is of little value in inter-herd control. For this protection tuberculin is the only diagnostic agent we have. 5. Finally, a physical examination will detect, if properly carried out, from 80 to 90 per cent. of the animals which are actually spreading the virus."

THE TURN OF THE TIDE FOR A GREAT VICTORY; THE ARMY VETERINARY BILL WILL WIN.

Important and encouraging news! The Army Veterinary Bill passed the Lower House of Congress unanimously on Jan-

uary the sixth. This successfully finishes the second reading of the bill, as the favorable report on it by the House Committee on Military Affairs, April 26, 1912, constitutes its first reading. Now let the dynamic energy of the whole profession come into play for the task of pushing the measure through the Senate. Towards the close of our editorial on this subject in the January number of the REVIEW we said: "The whole profession will soon be called upon to rally for the bill and it will leap to the call." Earnestly, confidently, we issue the call for every veterinary organization, every loyal veterinarian to get into the scrimmage that we may now carry this measure to its victorious goal. The news that this legislation is two-thirds won will go through the profession like a running fire. The electric force which it will create will reach such a voltage that nothing can stand its strength. It must irresistibly break down whatever small remnant of opposition there may by chance be in the Senate—if there be any at all. The work of the newly encouraged, bestirred and energized profession is now to carry by a single-hearted united effort the Army Veterinary Bill through the Senate and thus set at rest forever the opprobrious opinion that ours should be a profession outside the pale and below other professions in the Army.

How do we stand in the Senate? What work already has been done therein for this bill? What are the chances of final success for this legislation in the third and last reading by the Senate and a vote which will pass the measure before March the fourth?

By midsummer 1912 about fifty Senators had committed themselves to favor the bill, and during the last ten days of the second session of the Sixty-second Congress, closing last August, such additional support had been promised that, had we not at that time failed in the House, our bill surely would have passed the Senate. We have lost no ground in the Senate since last August; instead of that we have been extending our influence. The expectation is that we will surely win in that body when the

bill comes to a vote on the floor. There is, almost without exception, concurrence of the Senate on bills, such as ours is, when the House Committees favor any such bill and when the vote in the House is overwhelmingly for it. That our bill has received the unqualified endorsement of the Lower House in the unanimity of its vote goes a very long way to mollify any qualms tending to oppose it in the Senate and to make it triumphant in that Upper House. We may, therefore, work with strong hearts and unflinching zeal for passage of the bill through the Senate, having the assurance that our doggedness has a reasonable basis and that the concurrence of the Senate in the action of the House of Representatives not only is to be hoped for but to be expected.

Two things remain to be done; first, to bring the most potent influences to bear upon the chairman and members of the Senate Military Committee to cause them to report out favorably the bill to the Senate as a whole; second, to persuade every Senator to favor the bill, to agree to vote for it when it comes up for a vote on the floor of the Senate, and to actively work among his coterie of friends in the Senate that all may be induced to approve the bill. Chairman Hoskins has been working for a hearing of our professional representatives before the whole Senate Military Committee, to the end that that committee shall favorably report out the bill. This may happen any day. The time is exceedingly short before the close of Congress, March the third, and is full of danger. Procrastination is perilous. If the bill has not passed the Senate by the time the February REVIEW gets to our readers' hands they will make no mistake in urging their Senators to work for our measure, known as S. 5792, "A Bill to Consolidate the Veterinary Service, U. S. Army, and Increase Its Efficiency." The time for action being short is precious. But time, as one of the celebrated writers has said, is not measured by fingers on a dial, but by heart throbs. The hearts of all veterinarians devoted to professional advancement will find strength in the impending happy consummation, after many years of toil, in victory at last for the Army Veterinary Bill.

BETTER ORGANIZATION FOR STATE LIVE STOCK SANITARY CONTROL WORK.

In our February number one year ago, in publishing some notes on the meeting of the Minnesota Veterinary Medical Association, which had been held the previous month, we referred to the evidence of progression, and expansion in importance, of the Minnesota Association in relation to the live-stock industry of the state; and it would seem that the "Minnesota Plan" of organization for State Live Stock Sanitary Control Work is becoming generally recognized and is attracting the attention of other states, some of which have already organized along similar lines, and another contemplates doing so. This last one has been brought about, largely, by an address made by Prof. M. H. Reynolds, of the University of Minnesota, member of the State Live Stock Sanitary Board, before the Kansas Veterinary Medical Association, at its meeting in Topeka, January 7 and 8. The Kansas association gave a considerable amount of time to the consideration of better organization of state live-stock sanitary control work, especially on account of the recent epizootic among horses in that state; and by special arrangement Prof. Reynolds gave an address on "Fundamentals of State Live Stock Sanitary Control Work." The State Live Stock Breeders' Association, which was in session in Topeka at the same time, invited Dr. Reynolds to come over to their meeting and repeat the address for their benefit. Dr. Reynolds complied; with the result that the two organizations, each appointed a committee to co-operate for the purpose of securing from the present legislature a good State Live Stock Sanitary Association with a suitable appropriation. What has come to be known as the Minnesota plan was organized in that state something like ten years ago by Reynolds, and has since been adopted by North Dakota and several other states, and we understand that Kansas proposes to accept a suggestion for a further improvement of that plan by having a majority or possibly all of the board members ex-officio representing the State Live Stock Breeders' Association,

State Dairyman's Association, Agricultural College and Experiment Station, State Veterinary Medical Association, etc., rather than take the chance of political appointees. In our last month's edition of the REVIEW we referred to the ninth annual report of the Minnesota Live Stock Sanitary Board, and may add that the accomplished work reported therein is something that any state might be proud of.

The following paragraph extracted from the report on glanders indicates pretty clearly that they have that disease under control in Minnesota:

"Owing to the requirements of North and South Dakota, Montana, Iowa, Wisconsin and Canada, compelling all importations of horses to be accompanied by a mallein test chart, certifying that animals are free from glanders, over 6,644 horses were mallein tested, of which number 20 reacted and were later re-tested, appraised and slaughtered on request of owners."

If such percentages of reactors prevailed in all states, our country would be practically ridded of one of the most deadly scourges that horse flesh is heir to. At least it would be under control.

MUST DO FIELD WORK BEFORE RECEIVING DEGREE—At the last moment, after our forms were all made up, we received from the Iowa State College, about a page and a half of matter, relative to a plan for giving to the candidates for the degree of veterinary medicine, two weeks of practical training in the field, either of general practice or the meat inspection service, according to which of the fields the candidate expects to enter upon receiving his degree.

Arrangements just completed by President R. A. Pearson, will make it possible for students to go to Omaha, accompanied by Prof. Dimock and do practical work in the abattoirs, and attend lectures in the evenings on different phases of the work. Others who expect to enter general practice, will be apportioned among the leading veterinarians of the state. After this practical course, they return to the college for graduation. We regret that our space does not admit of the interesting details.

ORIGINAL ARTICLES.

FORAGE POISONING OR CEREBRO-SPINAL MENINGITIS.*

BY J. R. MOHLER, CHIEF, PATHOLOGICAL DIVISION, B. A. I., WASHINGTON, D. C.

Introduction.—About one hundred years ago (1813) there appeared in Würtemberg a fatal disease of horses which was termed "head disease," owing to the pronounced manifestation of brain symptoms. The affection spread through certain sections of Europe from 1824 to 1828 and was described as "fever of the nerves." In 1878 the attention of the veterinarians of Saxony was attracted to the disease which was then termed "nervous sickness," and within the next ten years it assumed an epizootic character. In fact the malady became so prevalent in and around Borna during the 90's that it became known as the Borna disease. The affection had spread like a plague on two occasions in Belgium, and has also exacted a heavy toll in Russia, Great Britain, Austria, Hungary and elsewhere. Its appearance in America is by no means of recent occurrence, for the affection was reported by Large in 1847 and by Liautard in 1869 as appearing in both sporadic and enzootic form in several of the eastern states. Since then the disease has occurred periodically in many of our states in all sections of the country, and has been the subject of numerous investigations and publications by a number of the leading men of our profession. It is prevalent with more or less severity every year in certain parts of the United States, and this year the Bureau has received urgent requests for help from Louisiana, Georgia, South Carolina, South Dakota, North Carolina, Kentucky, Texas, Virginia,

* Presented to the thirtieth anniversary of the Illinois Veterinary Medical Association, Chicago, December, 1912, and with slight modifications at the thirtieth anniversary of the Pennsylvania State Veterinary Medical Association, Harrisburg, January, 1913.

Maryland, New Jersey, West Virginia, Oregon, Kansas, Nebraska, Colorado, Missouri and Iowa. While this year the brunt of the disease seemed to fall on Kansas and Nebraska, other states have been seriously afflicted. In previous years, for instance, in 1882 as well as in 1897 the horses of southwestern Texas were reported to have died by the thousand, and in the following year the horses of Iowa were said to have "died like rats." However, Kansas seems to have had more than her share of this trouble, as a severe outbreak that extended over almost the entire state occurred in 1891, while in 1902 and again in 1906 the disease recurred with equal severity in various portions of the state.

Nomenclature.—There have always been considerable discussion and criticism regarding the different names which have been given this malady, and various terms have been applied according as each author in past outbreaks has considered certain symptoms or lesions as the paramount feature of the affection. Thus the disease has been termed cramp of the neck, head disease, mad staggers, sleepy staggers, etc. Through the recent investigations of Grimm, Schmidt, and others, it has been quite definitely established that "head disease," Borna disease and cerebro-spinal meningitis are one and the same, and Hutyra and Marek have accepted this opinion and incorporated it in their Special Pathology. While at first the Borna disease was considered as a form of cerebro-spinal meningitis, the work of Johnne and Oster-tag (1900) indicated that it was an independent disease because they failed to find any inflammatory changes in the central nervous system. Accepting this view, Friedberger and Fröhner have separated the two diseases in their Theory and Practice, basing their differential diagnosis chiefly on the absence of inflammation in the brain and cord of Borna's disease. However, since the publication of this excellent work in 1904, Oppenheim, Dexler, Schmidt and others have shown conclusively that inflammatory lesions are present in the central nervous system, although Dexler has pointed out that in some cases it is necessary to make a systematic examination of a number of slides to dis-

cover the inflammatory changes. As a result the more recent writers have adopted the viewpoint that the two terms, Borna disease and cerebro-spinal meningitis, are synonymous. When this disease appeared with such severity in certain sections of the United States last summer there were a number of persons who claimed that it was the Borna disease appearing in the new world for the first time; others diagnosed it as a new horse disease, as influenza, parasitism (due to the palisade worm), paralysis similar to poliomyelitis (infantile paralysis) of man, epidemic cerebro-spinal meningitis of man, and equine malaria from the fact that mosquitoes were prevalent and the horses were in lowlands. Fortunately for our profession, these erroneous diagnoses while participated in to a certain extent by some veterinarians, were usually the opinion of physicians, chemists, bacteriologists, who were not veterinarians, and others of limited veterinary experience. However, the vast majority of veterinary practitioners recognized the disease as their old torment, cerebro-spinal meningitis, staggers or forage poisoning. The latter name came into the literature of the disease as a synonym in 1900 following the investigation of an outbreak by Pearson. He was able to reproduce the disease in experiment horses by feeding them on damaged ensilage, and by giving them water to drink which had percolated through this silage. Doubtless influenced by the frequent absence of macroscopic lesions of the central nervous system, and by the analogy between this disease and meat poisoning of man, Pearson proposed the name forage poisoning which has been more or less in favor ever since. There are certain objections to this term, principally from the fact that it may suggest a form of poisoning produced by vegetation that is specifically poisonous, such as lupines, loco, larkspur, etc., or by ordinary forage that is poisonous of itself. This, however, was not the intent of Pearson, for by his analogy to meat poisoning it is evident that he did not wish to convey the impression that all forage was poisonous any more than all meat is poisonous. But when meat becomes contaminated with pathogenic bacteria, such as the *Bacillus enteritidis*, *Bacillus*

botulinis, etc., such meat is dangerous to man in the same manner that ordinary forage contaminated with certain unknown infective agents becomes dangerous to horses and produces forage poisoning. In other words, the forage is the carrier and not the primary factor in the disease. On the other hand, this term had a direct advantage in being readily understood by our clients and in conveying to the laymen's mind that an absolute change in feed is essential. After years of study and experimentation it is the consensus of opinion of practically all workers that the disease can be controlled effectively only by a total change of feed and forage, in other words, by preventive measures and not by medicinal treatment. That there is direct connection between the ingestion of green forage, exposed pasturage, newly cut hay and fodder, and the development of the disease is quite obvious, and that the ingestion of such forage when contaminated is the most important factor is equally obvious, as almost 100 per cent. of the cases in Kansas and over 95 per cent. of the cases in Nebraska of which we have any record were maintained all or part of the time under such conditions. Even such negative history is not always dependable, as the owner on one farm informed me positively that the dead horses had eaten nothing except old hay and grain, but when I noticed the closely cropped grass in an adjacent pasture, he innocently remarked that he always turned the work horses into the pasture over night. In fact in some sections it has been termed the "pasture disease."

Other names which have given to this affection are epizootic encephalomyelitis, meningo-encephalitis and meningomyelitis, enzootic cerebritis, leuco-encephalitis, etc., but personally I prefer the old-fashioned terms cerebro-spinal meningitis for the scientific term and blind staggers for the lay term. That the symptom of staggering is one of the most common manifestations of the disease is shown by the clinical observations of Schmidt who has made a close study of 415 cases, 377 of which developed staggering symptoms while standing or walking. The only symptom which occurred more frequently was the loss of appetite

appearing in 410 animals, while the symptoms next in prominence were grinding of the teeth which was observed in 349 cases, and difficulty in swallowing which occurred in 335 cases.

Etiology.—Unfortunately no specific bacteria, fungus, virus, or other toxic principle has yet been found which can be considered as the cause of cerebro-spinal meningitis in the horse. It is quite true that bacteriological investigation has given us a number of different organisms by an equal number of different investigators, each of whom has thought his particular organism to be the causative agent of the disease, but the fact remains that the four rules laid down by Koch have not been met with sufficient regularity to make the results satisfactory to the disinterested worker. Further investigations are necessary to decide which, if any, of the reported organisms is the true cause of the disease. That the disease may not have an etiological entity has been suggested by Weichselbaum, Hutyra and Marek. This would seem quite probable if all the claims for the following different etiological factors were to be accepted. For instance, Siedamgrotsky and Schlegel incriminated a micrococcus as the cause of the disease. On the other hand, Johne found diplococci in the cerebro-spinal fluid which he termed diplococcus intercellularis equi. Again Ostertag recovered streptococci in short chains from the blood, liver, urine and brain of affected horses. These organisms he termed Borna streptococci. Harrison, of Canada, isolated a streptococcus from the brains of horses affected with cerebro-spinal meningitis which was quite similar to Ostertag's, although it differed in forming capsules, staining by Gram's method, refusing to grow well on gelatin and in proving virulent for laboratory animals. In Minnesota, Wilson and Brimhall have also incriminated a diplococcus as the cause of cerebro-spinal meningitis of horses, cattle, sheep and pigs, and proved it to be the diplococcus pneumonia of Frankel. They likewise claimed to have isolated the micrococcus intercellularis meningitidis of Weichselbaum from the central nervous system of a cow showing symptoms of spinal meningitis. This latter organism is also reported to have been found by Christina in

primary sporadic meningitis in the horse and in a goat. The remarkable part of all the above investigations is that each author considers his particular organism as the etiological factor of the disease and the majority of these writers believe they have succeeded in producing the disease in horses by the inoculation of these differing agents. Some of these positive results are readily explained by the large quantity of turbid fluid injected under the dura. The inoculation of 5 and 10 c.c. doses of a heavy emulsion of any organism is likely to produce a headache in a horse or elephant for that matter, and the irritation set up by such a foreign material will necessarily produce exudation with accompanying mechanical pressure, so that it is not surprising to read in the post-mortem notes of some of these cases that the meninges bulged through the opening on cutting through the bones of the skull. Schmidt, of Dresden, is of the opinion that the nature of the infectious principle is not settled, and believes that the cocci and diplococci which have been ascribed as causative factors will in the future be deprived of their pathogenic relationship. Grimm, working in Zwick's laboratory in Berlin, isolated streptococci from horses affected with head disease or staggers which were not essentially different from the Borna streptococci of Ostertag. Owing to the regularity with which these cocci were taken from the brains of horses with "head disease," cocci which Grimm states possessed slight, if any, properties necessary to make them causal factors of disease, the question arose whether the same microorganisms are not also found in the brains of healthy horses. Grimm obtained the heads of 10 horses which were killed at the Zoological Garden for the animals, and which were by examination found to be free from any indication of cerebro-spinal meningitis. In the brains of these healthy horses he found cocci (staphylococci and streptococci), although cultures were made within a few hours after death, and at least one strain has shown many similarities to the streptococcus found by Ostertag. These results are very similar to the results of the Bureau. In horses which have died of forage poisoning it is not a difficult task to

recover various forms of cocci, in fact too many forms to make them all of etiological significance, while in those cases which have been killed in the late stages of the disease it is of common occurrence to have all the culture media inoculated with the various tissue remain sterile. On the other hand, we found micrococci, diplococci, streptococci and staphylococci so frequently in the brains of horses which have died of dourine, swamp fever, influenza, etc., that we have come to consider these organisms as representing an agonal invasion from the intestines without causal connection with any definite disease. Like Grimm, we have found some of these same cocci in the brains of horses that died of forage poisoning, and we have also recovered other species, all of which have been inoculated into experiment horses by various methods, including intravenous, subcutaneous, subdural and intralumbar injection as well as by spraying the nasal mucous membrane, with the result that two horses died following a nasal douche and a subdural injection respectively of a pure culture of two different cocci. The post-mortem on the former showed death to have been due to a strangulated intestine, while the second animal died suddenly without evincing any characteristic symptoms, although extremely nervous. Post-mortem examination showed an absence of any pathological lesions posterior to the brain. The dura mater was inflamed and distended with a yellowish exudate. The veins and capillaries of the cerebrum were dilated and engorged with blood while the third ventricle contained a cholesteatoma the size of a walnut. While the same organism which was injected was recovered from the brain tissue other horses injected with the recovered culture have continued to remain in a healthy condition. With the view of obtaining additional information regarding the significance of these various cocci to the disease in question, an antigen was prepared from a culture of each organism and tested against the blood serum obtained from affected horses in the field for complement fixation and agglutination as in glanders. In no case was a positive reaction to these tests obtained by the use of any of the antigens prepared from the different cocci isolated from diseased

horses. In this connection it may be noted that from the number of affections of the horse produced by coccoid organisms, this animal appears to be particularly susceptible to their action. In two outbreaks of forage poisoning investigated by Moore of Cornell, one gave him negative results from a bacteriological standpoint, while in the other pure cultures of the colon bacillus were obtained from the brain.

Another cause has been suggested for this disease in the finding of nuclear inclusions by Joest and Degen in the nerve cells of the hippocampus. These inclusions are similar to the Negri bodies of rabies, and are rounded or oval in shape, staining intensely with eosin. A large number of brains from affected horses have been examined in our laboratory for these bodies, but thus far with negative results, although the same technique applied to the brains of rabid animals brings out the Negri bodies with great clearness. There remains one widely accepted theory as to the causation of the disease which must be given consideration, namely, fungi on the feed. While most investigators have obtained negative results when feeding experiment animals upon moldy feed, some few have reproduced the disease by such feeding. Thus Mayo reports that a colt fed experimentally upon some of the moldy corn, which was held responsible for the serious outbreak in Kansas in 1890, developed the disease and died on the twenty-sixth day. Again the Kansas outbreak of 1906 was said by Haslam to have been produced by immature ears of corn infected by molds, although the exact mold was not discovered. By feeding horses upon this immature corn badly infected with molds, typical fatal cases of staggers were produced in four out of seven horses. Haslam also records the fact that severe losses of horses have occurred in other states when the grasses in the pastures become moldy. Klimmer commenting upon the negative results obtained in experiments with moldy feed asserts that the numerous losses occurring from the feeding of such material indicates the probability that the experiments were not sufficiently extensive from which to draw conclusions, and believes that the use of such feed should be discouraged.

Among other writers who have attributed the disease to toxic fungi are Michener, Trumbower and Harbaugh. The latter investigated the serious outbreak of this disease which occurred in Virginia and North Carolina in 1886, and claimed that every case of the disease could be traced directly to moldy feed. This theory of toxic fungi is not antagonistic to the facts in many of the best observed outbreaks, and knowing that fungi vary greatly in growth and in the elimination of various products under different climatic conditions, we may explain the irregularity of the symptoms as well as the occurrence of the disease under what may appear to be identical conditions. Thus Ceni, of Italy, states that molds are capable of producing poisons, but only at certain stages of their growth, and at other times they are entirely inactive. A case of this character was investigated by the Bureau several years ago in an outbreak among the army horses at an encampment in Pennsylvania. Many horses had died of cerebro-spinal meningitis as a result of eating moldy baled hay, and as soon as the hay was eliminated the deaths ceased. Other horses in the vicinity not fed upon this hay failed to contract the disease. At the suggestion of State Veterinarian Marshall the bales were opened and exposed to the sun for three or four weeks, after which time this hay was fed sparingly at first and later in usual quantities without producing any ill effect. Forage poisoning, therefore, seems to be an autointoxication rather than an infection and due to certain chemical poisons or toxins formed by organismal activity. These toxins may be present when the forage is taken into the body or formed in the gastro-intestinal canal and therefore the disease is a specific form of autointoxication. The nature of the substance which causes these harmful changes or the poisonous bodies that are formed remain unknown.

On account of this very old and very plausible theory so often advanced that the disease is due to toxic substances existing in damaged grain and fodder, a number of species of fungus were isolated during the past year from damaged corn and forage and grown on a sterilized corn medium or alfalfa infusion in

an effort to produce some toxic substance that would create disease when fed to horses. The pure cultures were allowed to grow for periods of one month's duration, in flasks containing 250 cubic centimeters of the nutrient medium and the contents of one flask was fed each day for a period of 30 days along with a sufficient quantity of sound corn and hay to make a normal ration, but no symptoms have thus far developed in the experiment animals, although only about one-half of the number of pure cultures isolated have thus far been used in this experiment.

It is possible that laboratory conditions alone cannot be made to parallel sufficiently close those which exist naturally in the growing plants and that toxic substances which might be produced in a natural state would not be generated in a corn meal medium in the laboratory. The by-products of the growth of both fungi and bacteria on corn and forage should certainly receive more consideration in future work. In view of the above information it must appear to the unbiased mind that the cause of forage poisoning remains an obscure and puzzling problem.

Occurrence.—Like cerebro-spinal meningitis of man, forage poisoning occurs in sporadic as well as enzootic and epizootic forms. The sporadic cases occur either in different localities from the epizootic outbreaks or in such sparse numbers as not to amount to an enzootic. Thus the outbreaks are quite variable in extent and severity. Sometimes it becomes very widespread, causing heavy losses, as in the recent outbreak in Kansas and Nebraska, while at other times there are only sporadic cases. Liebener believes that the development of the cause of the disease in Germany is favored by the rainfalls and warmth of the earth during summer and autumn. No conclusive evidence has ever been presented to indicate that the disease is ever transmitted directly from one horse to another. Sick animals have been placed alongside of susceptible horses in the same stable without conveying the disease to the latter and healthy horses have been placed in stalls previously occupied by animals which died of the disease, and have eaten from the same mangers without previous disinfection, but in no case has the disease been

transmitted in this manner. In the recent outbreak it was quite noticeable that livery and other work horses were not affected so long as they were fed on clean, dry forage, although they were constantly exposed to the disease by coming in contact with diseased horses. For instance, Dr. Busman, who was in charge of the Kansas field force of veterinarians, reports a case where horses were kept in adjoining corrals separated only by a wire fence. Those on one side were fed on green forage and recently cut cane and died from the disease, while those on the other side were fed dry feed and not one became sick. He also reports a similar occurrence in a livery barn where the horses had been fed on clean, dry feed without sickness, but when fresh cut bottom-land hay was substituted for the former feed the horses became sick within a few days. Another similar instance was reported by Davison, in charge of the field force in Nebraska, in the case of a farmer who owned a work team that was strictly barn fed. While attending the State Fair at Lincoln these horses were turned out on pasture for two days and both horses came down with the disease on the fourth and fifth day respectively after being taken off the pasture. It is such cases as these which have incriminated the forage and caused the disease to be known as "pasture disease" in some localities. Indeed some veterinarians report that all the animals affected had been on pasture, or having been removed from pasture, had been fed on recent cuttings of alfalfa, prairie hay, cane or kaffir corn, while no cases came under observation where the animals had been on dry feed all summer. A long period of dry weather followed by rainfall with considerable humidity and heat seems to favor the development and dissemination of the disease. The period from August 1 to October 1, 1912, presented exceptional climatic conditions in western Kansas and southern Nebraska, and it was observed that crops cut and cured before this date could be fed with impunity. During the first week in August a heavy rainfall started in Kansas and nearly twice the usual amount was recorded, mostly falling during the night and soaking in. This was followed by very high temperatures, the seventeen days from

August 23 to September 9 being the hottest series of days on record in Dodge City. There were also more than the usual number of cloudy or partly cloudy days with high relative humidities. The dew point was reached early at night and the deposit of dew was abundant, which is uncommon in that section. High humidities certainly continued throughout the day among the grasses near the soil. These grasses, which usually cure into hay on the root, became dotted with both parasitic and saprophytic fungi. Water holes, draws and buffalo wallows remained filled with water throughout most of the period. During the latter part of September frosts occurred accompanied not only by cooler weather but with lower humidity which are the significant factors in the subsidence of the disease, and after the first week in October the disease practically disappeared. Since then many owners have placed their horses back on the same pastures used during the serious stages of the disease and there has been no ill effects noted. This would indicate that there are good reasons to believe that the forage is no longer in condition to produce the disease and hence its use is safe, as in the case of the Pennsylvania baled hay previously mentioned. Somewhat similar conditions of climate obtained in Nebraska during the prevalence of the disease, but on September 25 a killing frost was recorded followed by several light frosts and a reduction in the relative humidity. After this time the disease rapidly subsided and finally disappeared. There is not much question but that some of this infected forage has been baled and shipped to various points, and it is therefore not unlikely that sporadic cases of the disease will appear in these sections under favorable climatic conditions. In this connection, attention should be called to the marked prevalence last summer and fall of the disease of cattle known as mycotic stomatitis which simulates the foot-and-mouth disease of Europe and is caused also by contaminated forage. This disease first appeared in Florida and spread over Georgia, North and South Carolina, Tennessee, Kentucky, Virginia, Maryland and into Pennsylvania. The climatic conditions were evidently appropriate for the development of the causative agent

on the forage, and as soon as the animals were brought out of the pastures and stall fed, the disease immediately subsided.

Symptoms and Lesions.—In most of the cases disturbance of the appetite, depression and weakness are the first manifestations observed, although all the symptoms vary within wide limits. This feature of the disease has been so ably presented by Reichel in the October number of Mulford's *Veterinary Bulletin*, by Campbell in the October number of the *Journal of Veterinary Medicine*, and Kinsley in the November number of the AMERICAN VETERINARY REVIEW, that I shall pass over the subject briefly.

Very soon the real symptoms of the disease appear. There is trouble in swallowing, drooping of the head and sleepiness which may give way to excitement and attacks of vertigo. An impairment of vision is noted with loss of co-ordination, resulting in a staggering gait or reeling while standing. There is muscular twitching, cramp of certain muscles, chiefly of the neck and flanks, and grinding of the teeth. Sometimes colicky pains are noted. If in an open space, the animal will walk in a circle, sometimes to the right, at other times to the left, and will try to push through any obstacle with which he comes in contact. In the stable he will press his head against the stall or rest it on the manger. Sometimes he will crowd backwards or sideways until he gets in a corner and remains there. If the temperature is taken at the beginning of the disease it will be found to be from 103 to 107 degrees Fahrenheit, but within 24 hours the temperature gradually falls until it reaches normal and then becomes subnormal. The pulse is from 40 to 90 and weak, while the respirations are fluctuating from normal to as high as 48 per minute. There may or may not be drooling of saliva, depending on the extent of the paralysis of the pharynx. The animal is often down on the second or third day and may or may not get up when urged to do so. While down he will go through automatic-like movements of pacing or walking, resulting in acceleration of the pulse and respiration. At this time the legs are held out stiffly and parallel to the ground. The hind legs of many

of these animals that have gone down are paralyzed and there is loss of sensation of the skin of these parts. The expired air is extremely fetid and there may be a croupous-like deposit of the throat which has caused the name "putrid sore throat." The conjunctiva may show injected blood vessels or petechiae on a yellowish tinted background. Coma or somnolence may be marked in those animals going down within the first few days. Those which remain standing may become violent or delirious, but ordinarily the horse is tractable and easily managed. Death usually occurs in from four to eight days, although in the acute form death may follow within 10 or 12 hours after the first symptoms are observed, while in the chronic cases the disease may last two or three weeks. The prognosis is very unfavorable, as 85 to 90 per cent. of the affected animals died in the beginning of the outbreak, but later the cases became milder with a consequent drop in the mortality.

On post-mortem the amount of lesions observable to the naked eye is in marked contrast to the severity of the symptoms noted. The pharynx and larynx are inflamed in many cases, and sometimes coated with a yellowish white glutinous deposit, extending at times over the tongue and occasionally a little way down the trachea. The lungs are normal, except from complications following drenching or recumbence for a long period. The heart is usually normal in appearance, except an occasional cluster of petechiae on the epicardium, while the blood is dark and firmly coagulated. The mucosa of the stomach indicated a sub-acute gastritis, while occasionally an erosion is noted. An edematous, gelatinous infiltration is observed in the submucosa of such cases. The first few inches of the small intestines likewise may show slight inflammation in certain cases, while in others it is quite severe; otherwise the digestive tract appears normal, excluding the presence of varying numbers of bots, *strongylus vulgaris* and a few other nematodes. The liver is congested and swollen in some cases, while it appears normal in others. The spleen is, as a rule, normal and at times the kidneys are slightly congested. The bladder is often distended with dark colored urine, and oc-

casionally a marked cystitis has been observed. The adipose tissue throughout the carcass may show a pronounced icteric appearance in certain cases. On removing the bones of the skull the brain appears to be normal macroscopically in a few instances, but in most cases the veins and capillaries of the meninges of the cerebrum, cerebellum and occasionally the medulla are distinctly dilated and engorged, and in a few cases there are pronounced lesions of a leptomeningitis. An excessive amount of cerebro-spinal fluid is present in most of the cases. On the floor of the lateral ventricles of several brains there was noted a slight softening due to hemorrhages into the brain substance. There is always an abundance of fluid in the subarachnoid spaces, ventricles and at the base of the brain, usually of the color of diabetic urine, and containing a limited amount of flocculi, but in a few cases it was slightly blood-tinged. The spinal cord was not found involved in the few cases examined.

A comparative microscopic examination of the brains of horses which died in Kansas, New Jersey, Maryland and Virginia this year with those of horses from previous outbreaks showed the same characteristic perivascular round-cell infiltration, especially in the olfactory lobe and the hippocampus. The pia mater showed an increased amount of connective tissue with dense round-cell infiltration which extended into the adjacent cortical portion of the cerebrum. The capillary blood vessels were engorged with cells and their walls were greatly infiltrated. Limited areas of leucocytic infiltration and small hemorrhages in the brain tissue were not infrequently observed. No cellular inclusions in the ganglionic cells were detected after prolonged examination.

Treatment.—One attack of the disease does not confer immunity. Horses have been observed which have recovered from two attacks, and still others that recovered from the first attack but died as a result of the second attack.

Inasmuch as a natural immunity does not appear after an attack of cerebro-spinal meningitis, it might be anticipated that

serum of recovered cases would possess neither curative nor prophylactic qualities. Nevertheless experiments were made along these lines with serum from recovered cases, but without any positive results. Similar investigations have been conducted by others in Europe with precisely the same results. With the tendency of the disease to produce pathological lesions in the central nervous system, it seems scarcely imaginable that a medicinal remedy will be found to heal these foci, and even where recovery takes place there is likely to remain some considerable disturbance in the functions, as blindness, partial paralysis, dumbness, etc. Indeed when the disease once becomes established in an animal drugs seem to lose their physiological action. Therefore, with all the previously mentioned facts before us it is evident that the first principle in the treatment of this disease is prevention, which consists in the exercise of proper care in feeding only clean, well cured forage and grain and pure water from an uncontaminated source. These measures when faithfully carried out check the development of additional cases of the disease upon the affected premises. While medicinal treatment has proved unsatisfactory in the vast majority of cases, nevertheless the first indication is to clean out the digestive tract thoroughly, and to accomplish this prompt measures must be used early in the disease. Active and concentrated remedies should be given preferably subcutaneously or intravenously owing to the great difficulty in swallowing even in the early stages. Arecoline in one-half grain doses intravenously has given as much satisfaction as any. After purging the animal the treatment is mostly symptomatic. Intestinal disinfectants, particularly calomel, salol and salicylic acid have been recommended and mild antiseptic mouth washes are advisable. Anti-pyretics are of doubtful value, as better results are obtained if the temperature is high by copious cold water injections. An ice pack applied to the head is beneficial in case of marked psychic disturbance. One ounce doses of chloral hydrate per rectum should be given if the patient is violent or muscular spasms are severe. If the temperature becomes sub-

normal the animal should be warmly blanketed, and if much weakness is shown this should be combatted with stimulants such as strychnine, camphor, alcohol, atropine, or aromatic spirits of ammonia. During convalescence the usual tonic treatment is indicated. Many of the so-called "cures" made their reputation at the time the outbreak was abating and when non-interference was proved to be equally effective. One of the most unpleasant developments of the outbreak this year was the great amount of "faking" which seemed to be the only contagious feature connected with the disease. All kinds of drug specifics, serums and vaccines developed like mushrooms and were exploited in almost every community devastated by the disease. Many tainted dollars were obtained from the suffering horse owners who grasped at every newly advanced treatment like drowning men clutching at straws. One aged farmer who had a very fair idea of the disease himself said to the quack who had injected streptococcus, diplococcus, pneumococcus and several other bacterins into his horse: "Well, you have used all the kinds of remedies I ever heard of on old Nell but one and now you might as well inject her with cowpox vaccine." In Nebraska, blackleg vaccine was reported to be used as a preventive on at least 1,600 horses and nearly 1,500 of them are said to have died as a direct result of the vaccine. This feature is now being investigated by the government. Dr. Munn, of Kearney, Neb., had apparently good success from the use of diphtheria antitoxin as a prophylactic agent and not a single animal developed the disease out of over 500 injected. It may be with this treatment as with others that the good results were due to the fact that the disease was on the wane before treatment was commenced, but no other line of treatment gave as good *apparent* results. Dr. Kaupp also reports in the *Breeders' Gazette* that only one horse died of 900 inoculated with a diplo-streptococcic bacterin he prepared, but the injections were made so late in the outbreak that its value is still problematical since thousands of horses in the affected area at this period failed to develop the disease, although they had received no preventive treatment whatsoever.

A NEW FIELD OF ETIOLOGICAL RESEARCH OPENED BY SCHMIDT'S MIRACULOUS TREATMENT OF MILK FEVER IN COWS.—A NEW THEORY OF AZOTURIA IN THE HORSE.*

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In the last few years a treatment has been discovered for milk fever in cows that infallibly cures that once fatal malady. It is probably the greatest discovery in therapeutics of this or any other age. Milk fever was (and is when not treated in this particular manner) the most generally fatal of any disease which attacks any species of animal, including man himself. The mortality previous to Schmidt's discovery was approximately one hundred per cent; now the recoveries are approximately one hundred per cent. (I believe the exact figures are ninety-eight per cent.) It is a genuine specific; its results are marvelous and bewildering. This is not the experience of one individual; it is the experience of all.

A treatment that is so uniformly successful under all circumstances must be extraordinary indeed, and too far out of the common to be relegated to the ordinary sphere of therapeutic measures; it must reach far beyond, deep into the very nature of the disease itself. I firmly believe could we but follow whither it leads we would find its termination in the very origin of milk fever itself, and the secret which has for so many centuries baffled all investigation would be ours at last. In this paper I propose to follow the treatment whither it leads as far as my light permits; if I fail in solving this riddle of the sphinx, I will be content, believing I have attempted its solution along those lines in which the riddle will be eventually solved.

* Presented to the November, 1912, meeting of the Veterinary Medical Association of New York City.

The history of this specific is as follows: A veterinarian named Schmidt conceived the idea that milk fever originated in the mammary gland. (The correctness of this idea marks Schmidt as a really great man, and I wish to do him reverence right here.) Schmidt originated a treatment, which has been modified somewhat, but has remained essentially the same in principle. It consisted originally of an aqueous solution of iodide of potash, one dram to the quart, injected into the mammary gland through its ducts. Schmidt's idea was that toxins originated in that gland, passed into the general circulation, producing the phenomena we name milk fever, parturient apoplexy, etc. Schmidt's mistake was in thinking toxins were formed in the gland, and that iodide of potash was the curative agent. It was soon found that any medicinal agent in solution was equally as efficacious as iodide of potash. Then oxygen was tried, and occupied the field for a short time. Oxygen was supposed to be superior as a germ destroyer and antitoxin; being a gas, it penetrated further into the ducts, even into their finest ramifications. The practical results seemed to justify its therapeutical application, for it proved a specific, but alas for its reputation as a superior therapeutical agent when another veterinarian, who was also a great man but a sorely perplexed one, forgot his oxygen tank one day, and in his extremity used a bicycle pump. The bicycle pump, forcing just common, ordinary, atmospheric air into the tubes, proved quite as much of a specific as oxygen. After this various syringes were patented or "patent applied for," which proved specific also. These syringes were all arranged with the idea that the air entering the ducts should be aseptic. (The aseptic part, I make free to say, was a failure.) It soon became apparent that asepsis had no part in the treatment, and its simplicity seemed to add mystery instead of enlightenment.

A few months ago another veterinarian, whose name, I regret to say, I forget, conceived the idea (diametrically the opposite to that conceived by Schmidt), that it was not a matter of germs, or toxins, or anything he could imagine, but that the disease

could be cured by almost anything. He tried some experiments along lines the very reverse of asepsis: he injected solutions, or rather, mixtures, into the udder containing stable sweepings which he swept off the floor—cow manure, sour milk, filth, etc.—in every instance curing the cow. In one experiment he removed a portion of the cow's skull and found the brain very anæmic; he then dilated the ducts and the blood returned to the brain and there was quite a hemorrhage. He killed this cow. It was certainly bold and original experimenting and it deserves high praise.

From this short synopsis of the history of the treatment of milk fever I think three points are made apparent: *First*, that the disease originates in the mammary gland; *second*, that local treatment cures it; *third*, that the results of the treatment do not depend in the slightest degree on the medicinal properties of the ingredients used, one agent being quite as efficacious as another, even when that other is as injurious a substance as cow manure, urine, or other filth.

Suppose we now take a typical case and apply Schmidt's treatment. A cow is quite suddenly attacked; when we arrive she is down, completely paralyzed and unconscious, cannot even swallow—in fact she is dying. A milking tube is inserted into the duct of each teat, and atmospheric air, oxygen, or a solution of iodide of potash, or some other medicinal agent, or a mixture of some agent that is the opposite of medicinal, like cow manure, urine, stable floor sweepings, sour milk, etc., is propelled with considerable force into the ducts. In a few hours, usually two to four, this dying cow is on her feet as well as ever.

This clinical history of a typical case of milk fever simply accentuates the wonderful results of the treatment, but it does not tell us its etiology. I have said, however, the treatment held the secret in its grasp, and I now propose to follow whither it leads.

The air, oxygen, or solutions or mixtures mentioned, has entered the ducts; it is forced far into them, to their terminal endings in their finest capillary ramifications. And then where?

In my opinion no further. Beyond the tubes is a slight amount of connective tissue, then the lacteal cells, then the blood vessels. If it enters the cells or blood vessels, then are my endeavors to solve the problem, to grasp its secret, futile, for if a mixture of cow manure, urine or other filth can, by entering the circulation, cure milk fever, or if curing, would not produce other and serious trouble, then am I astray in the very beginning of my investigation. A slight amount might enter the connective tissue, but no further, and this small amount must be injurious, retarding instead of advancing recovery. I am convinced the treatment does not pass beyond the tubes.

I have now followed the treatment whither it leads, from its beginning to its terminal. I first proved it was local, that it was confined in its influence to the mammary gland; now I have narrowed this sphere of influence to a part of the mammary gland. Within this small area does Schmidt's treatment infallibly cure milk fever; within the lacteal ducts does it perform this modern miracle of therapeutics. Has it yet given up its secret? Have we yet discovered the nature of milk fever? I think so. Positively we are in possession of one fact (else all that has gone before is error). Milk fever is intimately connected with the lacteal tubes. Pursuing our study from this point onward, we find ourselves immediately confronted with two alternatives: *First*, it is caused by something in the tubes but foreign to them; or *second*, something is wrong with the tubes themselves.

Between these two alternatives I choose to discard the former and accept the latter. I discard the former because I cannot imagine a mixture containing filth of all sorts *invariably* curing a fatal malady by its action in the tubes any more than I can imagine it curing the same malady by its action in the circulation. To believe so would be destructive of every recognized theory in medicine. If it is a germ, filth could only cultivate and multiply it; if an abraded surface, it would assuredly set up sepsis; there is nothing I can imagine that might exist within the tubes, or, for that matter, without, that such treatment would benefit in the slightest degree; therefore I discard it without any reservation whatever.

I accept the second alternative as unreservedly as I discard the former, and my reasons for accepting it are as follows: The tubes, as we are aware, are but passive factors in the production of milk, but because passive are none the less important; they receive the milk after it is manufactured; if they should by an accident or some other cause be unable to receive the milk, the lacteal cells, having no outlet for their product, would necessarily be arrested in their function of producing milk, and simultaneously cease removing those products from the blood from which they manufacture milk, with the result that these products in the blood, still being produced, would accumulate in the circulation. I express my conviction that an accident has happened to the tubes, that the accident is of such a character it could be duplicated if the cow herself was a man-made machine and the ducts the only outlet; that it is *purely mechanical in its nature* and no more a disease than a broken leg, and the symptoms no more the result of a micro-organism, a toxin, or an auto-infection, than are the evolutions of a "winged" bird as it falls to earth; that it is an accident that might happen to any set of tubes made of soft tissue inside the body or outside; that *they have simply refused to open*; that all the phenomena occurring, including its generally fatal results, are due to a very simple cause—a simple closing of the tubes.

The question which now confronts me is, what causes the tubes to close? As far as I can conceive, it may be due to three causes: *First*, over-distention; *second*, pressure from the engorged blood vessels; *third*, a glueing together of their walls by some plastic material after they have been emptied by the act of milking. Back of all these and all other reasons, however, is the overwhelming fact that the mammary gland of the domesticated cow is an abnormal gland. Intended by nature to supply milk for one calf (occasionally two), it is bred wholly for commercial purposes, and has been so bred for centuries. It seems strange that with such a history it has never been conceived that the gland might happen with an accident, either such as I have described or some other, as the horse bred for racing may rupture

a tendon by simple extension, an impossible feat for an underbred one to perform.

I have now followed the treatment to its terminal and the disease to its beginning; both meet at the same place. The treatment found itself confronted with closed tubes; these tubes it dilated; the cause being removed, the lacteals resumed their function of removing the toxic products which had accumulated in the blood, and did their work so well that in a few hours the all but fatal toxæmia was removed and the cow well.

I have now followed the problem in all its intricacies, and have made every point clear, all but one—the *nature* of the treatment and its *essence*.

Let me ask a question—two, in fact: *First*, what are you doing when you are dilating the ducts with your gas or air; of what are you thinking as you see the gland grow and grow to enormous dimensions and the skin becoming more and more tense; are you not thinking on the same lines as a person who is blowing up a football, or a boy who is blowing up soap bubbles? That is its nature. Are you not always thinking, can it stand more, and saying to yourself I think it can, I think it cannot, and whenever it is a failure it is the timid one who fails? That is its essence. That was always my thought long before I got the idea in my head that simple dilation constituted the cure. We all seem to know instinctively just what the cure consists of, and often when the air escaped in spite of my efforts to prevent it by the usual method of ligating the teats I dilated them again, and if necessary, again. The trouble seems to be that the treatment is entirely too simple; it certainly stands unique in that particular, and to accept it at only its face value seemingly threatens destruction to all preconceived ideas on the subject of therapeutics. Even more difficult of acceptance was the inference that the disease must prove even more innocent in its nature than its treatment. It meant revolution. I must admit it staggered me until I got used to it, but when a veterinarian cures milk fever, a disease that has successfully resisted every therapeutical agency since the dawn of medicine by injecting cow manure and other filth into a cow's

udder, the time for revolution is ripe. I believe it is here now.

As far as the discussion of milk fever is concerned, this paper might end, but the thought urges me on, the thought that Schmidt's discovery does not end with its explanation of the etiology of *one* disease—rather it is but a beginning. I myself believe it has opened up an *entirely new field of etiological research*; that we have by an accident stumbled upon a fertile but fallow plain filled with wonderful discoveries for the future investigator, a field based on the idea that a single gland in the body may be subject to the same disabilities as a particular part of a machine made by man; that it may get out of order in the self-same manner that accidents may happen to it, some slight, some serious, and some severe enough to put the whole machine suddenly and entirely out of commission.

There are many diseases that are still enshrouded in mystery that may possibly be explained on this theory. We are still very much at sea regarding the nature of such diseases as Graves', Addison's, Hodgkin's, Bright's, diabetes, rheumatism, gout, etc.; sudden deaths often occur in the midst of apparently good health, which cannot be explained by heart failure, apoplexy, ptomaine poisoning, acute Bright's, or acute indigestion; nor are those slighter ailments, designated as headache, nausea, nervous, bilious, "that tired feeling," the blues, etc., explained satisfactorily by a "disordered liver" or "stomach," constipation, etc. To-day epilepsy is considered to be a derangement of the nervous system; yesterday milk fever was so considered, with even more justification. It would be less surprising to find epilepsy having a simple origin than it was to find that milk fever had.

But the subject grows beyond me. I began this paper at Dr. Cochran's request meaning simply to pass tribute to a member of the profession whose discovery, I believe, constitutes an epoch in medicine, and to draw a parallel between milk fever and azoturia. As I said, the paper has grown and grown, and it was with difficulty I kept even within the bounds I have; I hope, however, that it has not made the paper less clear, nor befogged the new theory I am advancing of azoturia in the horse.

In studying this latter disease, I propose advancing along the lines pursued in the study of milk fever. Azoturia has many analogies to it: the attack is sudden; it occurs (usually) under supreme activity of certain organs (not the mammary, of course); is very fatal; recovery is often rapid and complete; there is no organic lesion as a primary cause, and its etiology is as much in the dark as ever.

As milk fever has always been connected with the period of lactation, when the mammary gland is in *supreme* activity, so azoturia has been connected with a period of *supreme* activity of digestion. The theories advanced are a hyper-nitrogenous condition of the blood, a defective liver, auto-infection, and in our extremity we have even requested the laboratory to discover a micro-organism.

I agree that azoturia is due to a hyper-nitrogenized condition of the blood, also that this hyper-nitrogenized condition of the blood is due to a defective liver. I propose to give my reasons for considering the liver the guilty gland, and to specify the defect.

The liver is the *first* to receive the blood from the intestines, it all passes through its tissues, it has the lion's share in blood metamorphosis. This is the one and only reason I hold the liver responsible. The special defect is with the bile ducts, and the nature of the defect—the same accident I have described as happening to the lacteal ducts, the same reasons given as producing closure of the lacteal ducts—hold good for closure of the bile ducts, excepting, of course, the emptying by milking. The ducts may possibly collapse normally in the intervals of digestion, and it may be that the absence of a gall bladder has some bearing on the matter. I would like to add, parenthetically, that I know of no reason why this accident could not happen to both ducts at other times than those of *supreme* activity.

To me there is a great analogy between the role played by the liver and that played by the mammary gland; the liver, as I have just stated, is the first to receive the blood for metamorphosis; the mammary gland receives it last. (In this respect it

is analogous to the kidneys.) The function of the liver may be said to be to feed the tissues, the function of the mammary to feed the calf. The liver, while producing blood metamorphosis, incidentally produces bile, and the mammary, while producing milk, incidentally produces blood metamorphosis, but though the processes are reversed yet are they the same, and an accident to the bile ducts would produce the same results in the liver as an accident to the lacteal ducts would produce in the mammary.

I wish now to refer back for a moment to the two theories of azoturia I am partly in accord with; I wish to call attention to an exaggeration, if not a misinterpretation, of a physiological fact, and to accentuate my point of departure.

It is universally admitted there is a lack of correlation between the different parts of the animal body (there must be); its exaggeration or misinterpretation is that this lack of correlation is extreme. These two theories are built on this error. Both theories may be summed up in a few words: the increased activity of intestinal absorption overcomes the system, is one; it overcomes the liver, is the other. That is, a perfectly normal system or a perfectly healthy liver (by way of a note here, I may add it is usually young and healthy horses that are affected) is overcome by a perfectly healthy set of cells in the intestinal villi. It sounds paradoxical. It is where I part company with these two theories. There is no proof of such lack of correlation in the system (but how many theories and what numberless diagnoses are advanced on the same misconception). Admitting there is great activity of intestinal absorption, how can we accept the inference that there is not an adequate increase in the system, or in the liver. These theories practically say that one set of cells (which cells, though part of the same system) can produce nutritive material so rapidly that it is impossible for the rest of the system or the liver to keep pace with it, in fact are so laggard that a condition of azoturia is induced in twenty-five minutes. How prodigal of energy nature was in one case, and how niggardly in the other. When we consider that this difference of activity is the difference between parts performing the same func-

tion, and intended by nature to work in harmony, the misinterpretation of the physiological fact mentioned seems almost like asserting that in an automobile race the hind wheels of the same car may crash into the front ones. I think without further proof both theories would be disproved by the fact that some severe cases of azoturia recover quite rapidly, but we have further proof, the proof that Schmidt's treatment gives us in milk fever, where we found the cow all but dead from toxic blood, yet the mammary cells rose so nobly to the occasion that in a few hours the blood was normal.

Before closing I would like to say a word on the treatment of azoturia. According to my theory the only scientific treatment would be to dilate the bile ducts; this being impossible, it must be treated on general principles and along the lines pursued in uræmia. In fact, I recognize a great analogy between that disease and the two I have been discussing, and if I might be permitted I would coin new names for these two to show their relationship to it. Azoturia I would call *bilemia*, and milk fever I would call *lactemia*, and as uræmia demands all possible means of ridding the system of the accumulating and accumulated toxins, so I would advise in bilemia the stimulation of the kidneys, the bowels, the skin, and in addition, the use of those medicinal agents which may combine chemically with the toxins, or act as physiological antidotes.

As all treatment must in the nature of the case be empiric, each practitioner's experience is worthy of note. In my own I have found but three drugs which I thought influenced the disease favorably; they are *aloes*, *sweet spirits of nitre* and *aconite*. I have found hot blankets of benefit. In my own practice I have never bled a horse, but I had the privilege of seeing Dr. Cochran bleed about fifteen with a recovery of about seventy-five per cent. (I am speaking from memory). Expressing my opinion, I would say bleed extensively, if necessary replacing the lost blood with salt solution, and even repeating the operation. Bleeding acts in two ways: it removes the toxic blood from the system and lessens the pressure on the ducts from the engorged capillaries.

Always remember azoturia is a self-limited disease; when absorption from the villous structure ends, the disease begins to recede.

At the last meeting I ended this paper with several questions; acting on the knowledge received from that discussion, I have taken the liberty of leaving all of them out this time and formulating a new one. I thought it would confine the discussion to the point at issue better. This is the question: What *other* pathological condition than the one I have mentioned (a simple closing of the lacteal tubes) can exist in a cow's udder, that Schmidt's treatment will infallibly cure?

NEWS NOTES ON THE FIFTIETH ANNIVERSARY OF A. V. M. A.—In a recent communication from Secretary Marshall of the A. V. M. A., he enclosed the following copy of a letter received from the New England Passenger Association:

"DEAR SIR—In connection with your application for reduced fares for the Fiftieth Anniversary Meeting of the American Veterinary Medical Association, am pleased to advise you that the lines in this association, excepting the Bangor and Aroostook R. R., Dominion Atlantic Railway & Steamship Lines and Eastern Steamship Corporation, have concurred in the tender of the Trunk Line Association and authorized reduced rate on fare and three-fifths, certificate plan basis, from the points named in the explanatory circular enclosed. Fee of twenty-five cents will be charged for each certificate vised. If any further detail is required in connection with fares from this territory will appreciate your advice. Very truly yours,

"M. L. HARRIS, Secretary."

The following lines constitute the New England Passenger Association: Bangor & Aroostook R. R., Boston & Albany R. R., Boston & Maine R. R., Canadian Pacific Ry., Central Vermont Ry., Dominion Atlantic Ry. and Steamship Lines, Eastern Steamship Corporation, Maine Central R. R., N. Y., N. H. & Hartford R. R., Quebec Central Ry., Rutland R. R. No other passenger association had been heard from to date, January 18.

THE RIGHT MAN IN THE RIGHT PLACE—Dr. Walter G. Hollingworth, at the request of Commissioner of Agriculture Huson, discussed the Stallion Registration Law problem at the New York Breeders' Association meeting, Utica, January 22.

HYDROPHOBIA (RABIES).*

BY DR. F. J. CAMBON, NEW ORLEANS, LA.

When asked by your J. Arthur Goodwin some few weeks ago for a paper, I consented to place my services at your disposal. While, however, I found willingness to oblige came readily enough, I discovered that the choice of a suitable subject came only tardily. Therefore, I decided to pen a few notes under the heading Hydrophobia.

"Hydrophobia" and "Rabies" are two different terms for the same disease; the former is derived from the Greek word, meaning dread of water. Consequently, as we find only in the human subject the dread of an attempt to drink water, the term "Hydrophobia" is properly used in such a case. A rabid dog will repeatedly attempt to drink water, even though the act induces a spasm of the deglutitory muscles. "Rabies," meaning rage or madness, applies more especially to the disease as we find it in the maniacal form in the lower animals.

The relation of water to the disease in the lower animals, chiefly dogs, is very much overrated. A dog never develops rabies from a lack of water—a common fallacy. A dog may be overheated during the hot summer weather; in addition it may not have sufficient water to quench its thirst, but these conditions alone cannot cause the disease. Invariably, whether the disease exists in man or animal, the history will point to a previous subjection by a diseased animal, for the transmission from animal to animal is necessary for the maintenance of the disease. Its occurrence is not limited to the hot weather, as was believed until recently; moreover, it should not be confused with a disease known as fits, common among dogs. This disease

* Presented to the Louisiana Veterinary Medical Association, at New Iberia, October, 1912.

differs from rabies in that it is of short duration, from thirty minutes to two hours. A rabid dog, on the contrary, is sick from three to seven days. A second part of differentiation between the two diseases is that rabid dogs seldom froth at the mouth; they may drool as a result of deglutitory paralysis, in which there is a drooping of the lower jaw, where, as in fits, there is profuse frothing accompanied by generalized clonic convulsions. Again, a rabid dog invariably dies as a result of this disease; on the other hand, one with fits often recovers. The latter disease should not be confused with rabies if the history is carefully investigated, and this confirmed by negative animal inoculations and absence of Negri bodies. The number of cases of rabies in Kansas City during the winter of 1909 and 1910 tends to disprove the "Dog Day" theory. The records of the Pasteur Institute for the winter showed an increase of about thirty-three per cent. in the number of cases over the summer months; these conditions, it should be added, were exceptional and largely due to the occurrence of an epidemic. Ordinarily we have only sporadic cases, yet veritable epidemics may occur as the result of negligence on the part of those whose duty it is to protect and preserve the public health.

All mammals are subject to the disease; it is, however, confined chiefly to dogs, owing to the fact that they naturally attack their own species. Although the canine by nature follows this rule, in the excitement stage it goes to the other extreme and bites even its own master, not to mention numerous horses, cattle, hogs, etc. The most vicious breeds are, of course, the most dangerous and do the most damage. About ninety per cent. of the cases are due to rabid dogs; the next most important factor in spreading the disease in this country is the cat, which is responsible for about four per cent. of the cases; the remaining six per cent. are due to horses, cattle, wolves, etc. In some countries, as in Russia, the wolf contributes a high percentage of cases.

Hydrophobia is an acute inoculation disease communicated to man by the saliva of an animal suffering from rabies. It is

due to a definite specific virus which is transmitted through the saliva either by the bite of a rabid animal or by the saliva coming in contact with a wound already existing. The normal habitat of the virus is the nervous system, and it retains its virulence only temporarily when introduced into any other system of organs. The fresh fixed virus injected into the blood stream does not usually cause the disease; moreover, its injection by the intramuscular route does not give a high mortality, about fifty-nine per cent. If moderately thick homogeneous emulsions in collodion sacs are introduced into the peritoneal cavity, it is found that the virus is destroyed in six hours. The virus rapidly loses its virulence when not in its normal habitat; it is readily destroyed by heat and desiccation. In short, laboratory experiments prove that it cannot exist "in nature." When inoculated into a wound, this virus must come in immediate contact with a broken nerve trunk in order to survive and reproduce itself. If it gains entrance to the nerve trunk it is protected from the antagonistic action of the blood and lymph streams; it slowly extends to the cord and brain. Here a favorable media exists; the virus grows rapidly and the characteristic toxic symptoms are produced.

In considering the danger of infection from a wound inflicted by a rabid animal we find it advisable to classify the patients according to the following: (1), Location of the bite; (2), severity of the wound; (3), the degree of cauterization; (4), the lapse of time before reporting for treatment; (5), the stage of the disease in the animal at the time the wound was inflicted.

It may not be amiss to mention the great importance of the proper cauterization of the bite in dealing with the disease. The free use of fuming nitric acid is a satisfactory method of cauterization. The penetration of the acid makes it a valuable cauterization agent, but even when this procedure is carried out, about 10 per cent. of the experimental animals die. It is advisable, after sufficient application of the acid, to wash the wound freely with sterile physiologic salt solution, thus removing the acid and

preventing unnecessary destruction of the tissue. If nitric acid is not to be had, full strength phenol may be used.

It is, however, eminently important that this cauterization agent be washed from the wound by the free use of absolute alcohol. This procedure prevents subsequent ulceration which is so common when the alcohol is neglected.

The two agents, nitric acid and phenol, destroy the virus by virtue of their cauterizing action; yet in high dilution, neither has a disinfectant action on the virus. In fact, a one per cent. solution of carbolic acid is an excellent preservative for this particular virus; for instance, an emulsion of rabid brain made up in a one per cent. phenol solution, or any of its numerous derivations, will preserve the virulence for several weeks. In formaldehyd solution, on the other hand, we have a specific disinfectant for the virus. The specificity of the antiferment action of formaldehyd on rabies virus is easily demonstrated by laboratory experiments.

Formaldehyd in as high a dilution as 0.025 per cent. will destroy the virus in a short time. In the treatment of wounds inflicted by rabid dogs, the use of a 5 per cent. formaldehyd solution applied to the wound for twelve hours is preferable to the cauterizing action of nitric acid or phenol because of the specific disinfectant and penetrating action of the former.

Especially should this preliminary preventive measure be instituted in severe lacerated wounds, for in such wounds the degree of infection is high. The immediate treatment should not be neglected even after the lapse of a couple of days; moreover, under the latter condition, the wound should be opened and thoroughly scrubbed. If every wound, especially severe ones on the head, be thoroughly cauterized, and this immediately followed by anti-rabic treatment, the mortality would be nil among those bitten.

As to the time of exposure, it can reasonably be said that a wound on the hand after a delay of three weeks is quite as dangerous as a bite on the head exposed only a few days. The cumulative action and extension of the virus along the nerve

trunk to the central nervous system during the interval of exposure should always be borne in mind. Therefore, it is quite as necessary to prescribe an intensive form of treatment to a patient bitten slightly on the extremities with a prolonged exposure as it is to one with a recent head wound.

It is quite safe to say that the virus is not transmitted by the bite of a rabid animal until two days previous to the appearance of the first symptoms. The early symptoms, however, are often very obscure and so slight that they are not recognized. So it is with some difficulty that a decision is reached in advising patient bitten slightly on the extremities with a prolonged exposure. If a dog which is naturally not a vicious kind suddenly bites without provocation, it should be tied securely and kept under close observation for at least seven days. Should the dog develop symptoms of rabies during its confinement the bite should be considered dangerous. An investigation of such a case will usually reveal the fact that the external cause inciting the dog to bite was not sufficient to cause the same act in the dog when normal. Occasionally the only recognized symptom in the early stages is a tendency to bite, but such cases, if kept under observation, develop well defined symptoms within a few days.

The first symptoms in rabies are those of mild or marked excitement, nervousness, irritability and often a tendency to stray away from home. This stage of the disease has a duration of about two days, seldom more than four days. As the disease progresses, the excitement becomes more marked, and unless this is cut short by generalized paralysis, the dog becomes furiously rabid. In this condition the dog is uncontrollable, it has hallucinations, and may, without provocation, bite its own master.

Partial paralysis marks the onset of the second stage of the disease. The paresis may be unilateral, or it may be limited to the hind extremities or the lower jaw. If there is paralysis of the posterior extremities the dog walks with a humped back and an apparent stiffening of those parts. Later they become weak and tremulous, and it is with difficulty that the dog walks. The droop-

ing of the lower jaw is a diagnostic sign, although it is not present in more than about thirty per cent. of the cases. The unilateral paralysis is characterized by a turning of the head to one side, and a tendency to cross the fore paws.

As this condition becomes more pronounced the animal is inclined to, and may run or walk in a circle. During the second stage the voice may change; it is at first low and muffled, finally it becomes difficult to evoke and is a succession of low pitched howls coming from far back in the throat. As the paralysis of the cheeks, mouth and lower jaw becomes more evident the power to bark is completely lost.

Although few rabid dogs eat and drink without discomfort, yet we find in the majority of cases repeated attempts will be made without success. In some cases, solid substances may be swallowed without discrimination, and on post mortem, when foreign material is found in the stomach there is sufficient evidence to arouse suspicion of rabies. Food may be held in the mouth for a short time and then dropped, a condition which may occur in advanced paralysis of the deglutitory muscles. As was stated in the opening paragraph, the rabid dog has no fear of water; a dread of water is, however, characteristic of hydrophobia in the human subject. The dog may not be able to swallow; despite this fact it will make many attempts, succeeding only in emptying a dish of water by splashing the water over the sides in the eager attempt to lap it up. The owner of this dog usually makes the statement that it could not be rabid because it drank one or more dishes of water.

When the paralytic stage appears early in the course of the disease the dog is usually morose but not aggressive; under such conditions we have the so-called dumb rabies. This type, however, is not as common as the maniacal form, in which there is a condition of furious rage, in the diagnosis of which there can be no mistake. This is the most common diagnostic feature of rabies in dogs. In this state of delirium the animal runs amuck, furiously attacking all animals, including man, and even its own master. It may travel as far as forty miles, leaving in its path

numerous bitten animals which in turn may act as spreaders of the disease.

The stage of paralysis lasts from one to four days, after which the third stage appears with complete loss of equilibrium. This period of paralysis varies from a few hours to two days. Finally, from two to seven days after the appearance of the first symptoms, death results from complete paralysis of the respiratory center.

The only method of treatment found so far, to be of any value in this disease is prevention.

The prevention of rabies infection resolves itself into two procedures. (1) The destruction of all ownerless and vagrant dogs, and the muzzling of all dogs that appear upon the streets or in public places; thus preventing the propagation of the virus. It is of interest to learn that rabies has been so completely eradicated from Great Britain by the enforcement of the muzzling regulations that the pathologists of that country were obliged to send to this country for material from which to make a study of the Negri Bodies when the discovery was made that the latter bore a most intimate relation to the transmission and development of rabies.

(2) The preventive inoculation known as the Pasteur Treatment, by which an immunity is produced by the subcutaneous injection of the virus of rabies in an attenuated form, beginning with the mildest virus and gradually going to up to one which possesses nearly or full virulence.

In the preparation of material for the preventive treatment, rabbits are inoculated with "fixed virus," a term given by Pasteur to virus, that is so exalted in virulence by successive inoculations (100 rabbits), that it will produce the death of these animals in six or seven days. Beyond this point no increase of virulence can be obtained, hence the name, "fixed virus." The spinal cord is removed aseptically from rabbits killed by the inoculation of fixed virus, cut into three pieces and suspended over a solution of caustic potash in a dark chamber. Here the cords are kept in the dark at a constant temperature of 23° C. for four-

teen days. Emulsions of the dried cord are prepared in sterile salt solution or broth and injected every day, or sometimes more frequently during a period of fifteen to twenty-one days. As a rule, the most attenuated material (14-day cord) is injected first, and this is followed by virus of gradually increasing strength. The method is essentially one of active immunization, and involves a race between the action of the attenuated virus and the virulent virus, introduced by the bite of the rabid animal. It follows therefore that the preventive treatment must always be begun at the earliest possible moment after the bite.

While the anti-rabic vaccine has been extensively used for the last twenty-four years for the prevention of rabies in the human, it is of comparatively recent date that it has been used in veterinary medicine. Its use by veterinarians has been made possible by its preparation in a form that can be sent to the practitioner at a point remote from the laboratory. Such a vaccine is of inestimable value in the control of rabies, and it is of considerable economic importance to the live stock industry.

During the month of March, 1911, Dr. Nisbet, of the American Biologic Company, of Kansas City, gave several animals bitten by a rabid dog the Pasteur Treatment. (The dog during the inoculation was found by microscopic and subdural inoculation to be rabid.) The treated animals did not contract rabies, while on the other hand, an untreated cow, bitten the same day by the same dog which bit the treated ones, died four weeks later of rabies.

Dr. Nisbet also supplied data on nineteen other cases as follows: Nine dogs, eight horses, one mule and one cow which were treated with anti-rabic vaccine supplied by H. M. Alexander & Co. Three of the 19 cases died of rabies; one dog died on the thirteenth day; one horse was destroyed after the treatment was completed because symptoms of rabies became evident, and the cow developed rabies one day after the treatment was completed. The dosage for the before mentioned ten cases was the same as given by Dr. Nisbet, but twenty-four doses were

given instead of twenty-one. Judging from the fact that the fatal cases developed rabies after treatment was completed, or near the end of the treatment, it seems advisable to use a more intensive treatment, that is, the doses given should be of a less attenuated cord.

Record of treatment administered to horse at Kansas City College of Comparative Medicine from March 6 to 23, 1911, inclusive. Each dose consisted of one centimeter of cord emulsified in five cubic centimeters of sterile salt solution.

Dose.	Proposed.	Age of Cord and Dosage.	Number of Cord.	Number of Injections Given Each Day.
No. 1.....	3- 6-11 A.M.	5 cc. of 8 days	2233 E	1st day 10 A.M.
No. 2.....	3- 6-11 A.M.	5 cc. of 7 days	2070 Z	1st day 3 P.M.
No. 3.....	3- 6-11 A.M.	5 cc. of 6 days	2070 Z	1st day 6 P.M.
No. 4.....	3- 7-11 A.M.	5 cc. of 5 days	2233 B	2d day 10 A.M.
No. 5.....	3- 7-11 A.M.	5 cc. of 4 days	2070 Z	2d day 6 P.M.
No. 6.....	3- 8-11 A.M.	5 cc. of 3 days	2233 D	3d day 10 A.M.
No. 7.....	3- 9-11 A.M.	5 cc. of 2 days	2071 J	4th day 10 A.M.
No. 8.....	3-10-11 A.M.	4 cc. of 2 days	2070 Z	5th day 10 A.M.
No. 9.....	3-10-11 A.M.	4 cc. of 2 days	2071 G	6th day 10 A.M.
No. 10.....	3-12-11 A.M.	4 cc. of 5 days	2072 D	7th day 10 A.M.
No. 11.....	3-13-11 A.M.	4 cc. of 3 days	2072 D	8th day 10 A.M.
No. 12.....	3-14-11 A.M.	4 cc. of 2 days	2072 D	9th day 10 A.M.
No. 13.....	3-15-11 A.M.	4 cc. of 5 days	2072 D	10th day 10 A.M.
No. 14.....	3-16-11 A.M.	4 cc. of 4 days	2072 D	11th day 10 A.M.
No. 15.....	3-17-11 A.M.	4 cc. of 3 days	2072 D	12th day 10 A.M.
No. 16.....	3-18-11 A.M.	4 cc. of 3 days	2072 D	13th day 10 A.M.
No. 17.....	3-19-11 A.M.	4 cc. of 2 days	2072 D	14th day 10 A.M.
No. 18.....	3-20-11 A.M.	4 cc. of 4 days	2072 E	15th day 10 A.M.
No. 19.....	3-21-11 A.M.	4 cc. of 3 days	2072 E	16th day 10 A.M.
No. 20.....	3-22-11 A.M.	4 cc. of 3 days	2072 E	17th day 10 A.M.
No. 21.....	3-23-11 A.M.	4 cc. of 2 days	2072 E	18th day 10 A.M.

Laymen will ask, "Where did the first case come from?" It is useless to discuss this question. Science is unable to solve the question of the origin or the end of things.

Rabies is never spontaneous. A dog may be exposed to conditions that are directly contrary to his habits of life, such as cold, heat, abuse, bad food, no food, too much food, yet he will never develop rabies unless infected with it. It is always the result of a bite or infection from a rabid animal. If we are to follow the teaching of scientific investigation, we are led to the conclusion that rabies is transmitted to man and to beast very largely through the bites of rabid dogs, and that the dog carries it from one locality to another. This being the case, the question of the control and eventually the eradication of rabies

resolves itself into the single and not over difficult problem of the elimination of the homeless, wandering dogs, and the careful watching and better care of the others. Whether this will be brought about by a general enactment of the chain and muzzle ordinance that has been so successfully enforced in other countries, or by a special dog tax, or by some other means, I am not prepared to say.

As a member of this association, I do earnestly recommend that we, either as a body or as individuals, take a firm stand on this question. We owe such action to our fellow men, also to the animals we are trying to save, and above all, to the faithful friend of man, the dog.

The period of incubation is quite variable, depending on the site of the wound, which is almost always a bite, the amount of virus introduced and its virulence. In general it may be said for all animals that the period of incubation seldom exceeds sixty days, the average period as given by Ravenal is as follows:

Man, 40 days; dog, 21 to 40 days; horse, 28 to 56 days; cats, 14 to 28 days; pigs, 14 to 21 days; goats, 14 to 21 days; birds, 14 to 40 days.

In rabbits inoculated subdurally with the brain from rabid animals, I found the period of incubation to vary from twelve to sixty-two days, and the duration of the disease to range from a few hours to three days.

AT A CONFERENCE ON GLANDERS, called in the Second Assistant Commissioner's office, in New York City in January, Commissioner Huson stated that 1,631 cases of glanders had been destroyed by his department during the fiscal year beginning October, 1911, and ending October, 1912; and out of that number 1,260 had been in New York City and Brooklyn. The object of the conference was to get an expression from the veterinarians and horse owners leading to an amendment of the agricultural law relative to the control of that disease. Detailed report in next issue.

DR. F. I. POGODA, Troop M, Fifth Cavalry, Schofield Barracks, Honolulu, H. I., has been transferred with his troop to Fort Huachuca, Arizona.

SOME OF THE MORE IMPORTANT INSECTS AFFECTING OUR FARM ANIMALS.*

BY W. H. DALRYMPLE, M.R.C.V.S., LOUISIANA STATE UNIVERSITY.

(Concluded from January number.)

The flies, however, seemed to pass from us, in plague-like numbers at least, and although present more or less all of the time, we do not now hear of any great damage being done by them.

Eggs are said to be laid not only in or on fresh wounds, but also in decaying vegetable matter, carcasses, etc., so that it would appear this fly is somewhat omnivorous in its taste, and this may account, in some measure, for its attacking fresh wounds when other classes of its food become scarce or difficult to obtain.

The usual line of treatment was to apply to or pack the wounds with some effective agent to destroy the larvæ or maggots, and, if possible, repel attacks of the fly.

Belonging to the family oestridæ are the bot-flies, some of the species being extremely destructive in various ways.

You are all, doubtless, quite familiar with this family of dipterous insects, and I will only touch upon some of the more important phases of their life history and the damage occasioned by them.

The mouth parts of this group are either rudimentary or entirely wanting, so that the flies can neither bite nor pierce the animal's skin.

According to Verrill, the eggs of the *gastrophilus equi*, the horse bot-fly, contain more or less perfectly developed larvæ when laid, and when they are mature, or have been a few days attached to the hair, they burst open and allow the young to escape almost instantaneously when moistened. Thus, when the

* Paper presented at the thirtieth anniversary of the Illinois State Veterinary Medical Association, Chicago, December 6, 1912.

horse licks itself or its companions, the warm moist tongue hatches the eggs, and the young larvæ are transferred to the stomach, where they fasten themselves to the lining membrane by two hooks.

It has been said that the grub or bot spends about eight months in the alimentary tract, six weeks in the pupal stage outside of the body, and after the fly emerges from its pupal case it occupies the remaining ten weeks of the twelve months proceeding with the business of providing for another generation of bots.

But in addition to the *gastrophilus equi* there are other bot flies affecting the horse; viz., the *gastrophilus hæmorrhoidalis* or red-tailed bot-fly, and the *gastrophilus nasalis* or "chin-fly." Their habits are similar to the *equi*. There are certain distinguishing characteristics, however, as to color and size and the tendency to attack the neighborhood of the lips and nose within easy reach of the tongue.

As a matter of prevention, the indications would necessarily point to preventing the fly from laying her eggs by suitable repellents; the use of a solution, such as carbolic acid, some of the coal tar dips, kerosene, etc., to destroy the eggs attached to the hair, or shaving the eggs off with a sharp knife or razor.

In case of stabled animals, ordinary good grooming will generally serve to remove any eggs present, but with horses, colts, etc., at pasture the case is different, as the animals may, in some cases, not be seen for considerable periods. However, it may be possible, during the late summer and early fall, to have this class of stock examined at short intervals, of a week or two, and the eggs removed or destroyed, which may be accomplished in the manner and with the materials just suggested.

It is difficult to recommend any single, definite line of action that may be considered *par excellence*. However, a working knowledge of the life history and habits of the insects may often suggest methods that will prove more or less effective in many cases.

As to remedial measures, well, all sorts have been recom-

mended. Those which happen to be administered at or about the time the bots are leaving the digestive tract in considerable numbers, and of their own accord generally get the credit of being "specifics."

So far as my information goes, the bi-sulphide of carbon seems to have given the most satisfactory results in the removal of the oestrus larvæ. It was Perroncito, I think, who was the first to report on the use of this agent in this connection. It is recommended to be given to adult horses in gelatin capsules containing 10 grams each, and 8 grams for colts. One capsule is given at one-hour intervals until three have been administered, and the last capsule followed 12 hours later by a purgative.

Passing to the bot-fly of cattle, sometimes called warble or wolf-fly, the interesting announcement was made by Dr. Cooper Curtice some years ago, and which seems to have been verified since, that the larvæ reached the backs of the animals through the mouth, and by way of the oesophagus, which was quite a discovery, and indicated that our common form was not the oestrus bovis of Europe, but oestrus lineata, or heel-fly, likewise, however, European in distribution. The larva is said to occupy several months in getting to the skin, while the development after reaching this location is more rapid.

The losses from warble-flies may be considered from three points:

1. Loss on hides perforated by the grubs, subjecting them to discount or rejection in the markets.
2. Loss in milk and beef supply, caused by fretting and stampeding, due to the presence of the flies when depositing their eggs.
3. Loss of vitality and weakened condition, and consequent loss in milk or beef, due to the presence of the warbles in the back, and possibly the sores occasioned by them.

It is difficult to obtain an accurate estimate of the sum total of these losses, but as the result of many inquiries and testimony

from numerous sources, the late Miss Eleanor Ormerod, the British entomologist, estimated the loss in England at \$5 per head for cattle. What the aggregate amount in this country would be, it is hard to say, but it would certainly run away up into the millions of dollars. Prof. Herbert Osborn states that omitting the creature's comfort as a matter of mere sentiment, and considering the question from the practical standpoint of money returned, it requires only the very modest estimate of the loss of \$1 per head to the cattle of the United States to show a loss of about \$36,000,000 sustained by the country on the basis of the census of 1880. But in 1910 there were something over 69,000,000 milk cows and other cattle in the United States which, at \$1 per head, would make the loss from the ravages of the warble-fly total up the enormous sum of, approximately, \$69,000,000.

The remedial measures recommended are several; viz., those to prevent the deposition of eggs, those to destroy the eggs and young grubs, and those to kill the larvæ after passing under the hide. I am firmly of the opinion, however, that if the standard arsenical solution was systematically used all over the country as it is with us in the South for the destruction of cattle ticks it need not be many years before the country was practically free of these expensive parasites. It is our experience that in sections where dipping in this solution has been practiced regularly and systematically for a season or two, cattle are practically free of these grubs, wolves, or warbles, in their backs.

The last of this group which I will mention, briefly, is the sheep bot-fly—*oestrus ovis*.

The older authorities claimed that this fly laid its *eggs* in the nostrils of sheep. Later observers state, however, that the living larvæ, or maggots, are deposited, and that this point may now be considered as well established, except, perhaps, when the flies are fortunate in finding their victim without delay, eggs may be deposited, but in such cases they doubtless hatch immediately after deposition.

The larva at once begins to work its way up the nostrils and

nasal passages, and frequently reaches the sinuses. It attaches to the membrane by two small hooks and feeds upon the mucus. When ready to assume the pupa form, those grubs that are able to do so pass down to the ground where they quickly bury themselves. They remain in this dormant stage for about 40 or 50 days, or more, according to weather conditions, when each fly pushes open a little round cap-piece at the head-end, and thus arrives at maturity.

The grubs found in the head may range from two or three to quite a considerable number. I have, myself, taken forty-two of these larvæ from the head of a sheep that had died from parasitism of a different nature, however.

The prevention of the deposition of the young larvæ is generally the point aimed at, and various means are resorted to to accomplish this end. One that is quite common is to bore two-inch auger holes in a log, fill the holes with salt, and smear tar around the upper edge so that the sheep, in obtaining the salt, tar their own noses, which acts as a repellent to the flies.

Valuable animals may be trephined to remove the grubs from the sinuses.

I am rather inclined to the opinion that the country butcher-pen is a great harborer and breeder of these flies, and that if sheep's heads, which are often thrown away as offal in such places, were carefully destroyed, to destroy the larvæ that may pass from them to the ground to pupate, it might materially reduce the number of these flies in each locality.

Another source of great annoyance to certain classes of live stock, and which it is believed is also responsible for the transmission of some of the important infections, is the family tabanidæ, to which the horse-flies belong.

The members of this family are large, some of them being among the largest of the order diptera, and the females are provided with powerful mouth-parts, by means of which they inflict painful bites upon horses, cattle and other animals. Their flight is very strong and rapid, and is attended with a buzzing, tormenting noise.

Such of the larvæ as are known are either aquatic or live in moist earth, and are carnivorous. But notwithstanding the abundance of the insects, comparatively little has been done toward determining the early stages of the species.

Being carnivorous, and predatory upon snails, injurious insects, etc., the larvæ of the tabanids have sometimes been classed as beneficial, which may compensate, in some degree, for the bloodthirsty habits of the adult females. They are, unfortunately, so far as the animal is concerned, not open to successful attack in the larval stage.

Tabanids are widely distributed—species occurring in all parts of the world. Up to about 1896 it was said that 1,300 or more species were known, of which 150 were credited to North America. Since that time, however, the number has been considerably added to, over 300 having been catalogued so far.

The circumstantial evidence with us in the South is strong enough to force the conviction that these flies are wide distributors of anthrax infection, as it seems to be in seasons of their greater prevalence that this disease is most abundant.

Powerful repellents are recommended, or nets, in the case of animals that are being used. A thin film of kerosene over pools of stagnant water, frequented by the flies, will destroy large numbers of them, which was recommended some years ago by Porchinski, a Russian entomologist. But the greatest relief will come through clearing, draining, and the cultivation of the land areas which at present form the breeding places of these animal pests.

Just a word about buffalo gnats, family simuliidæ.

There are several species of buffalo gnats, and the injuries caused by them are among the most serious resulting from insect attack on domestic animals. They are small black flies, with a humped thorax and the head bent under, somewhat resembling the buffalo, and from which, I presume, they received their name. The early stages are aquatic, and the larvæ of the southern buffalo gnat (*simulium pecuarum*) is carnivorous, and probably others have a similar habit.

These gnats evidently emit a poison when biting, and a number of remedies have been tried to counteract it, but without any uniformity of effect. Aqua ammonia externally, and, internally, ammonium carbonate and whisky, have been used with fair results, at the same time keeping the animal in a cool, darkened stable, and also immersion in the cold water of running streams. Burning smudges attached to the hames is a method frequently adopted when the work stock are in the field.

While it has not been absolutely shown that these gnats are responsible for the transmission of disease—except their presumed connection with the transmission of pellagra—their habits of feeding upon so many different varieties of animals, as well as man, make it possible for them to act as carriers of infection.

Being aquatic, or semi-aquatic, in the early stages of their development, it would seem that attention should be given to their breeding places, and the attack directed toward their destruction in the immature forms.

My paper is already considerably longer than I had hoped to make it, but I think it would ill-become me—from the tick-infected section of the country—to close without making brief allusion to the "*margaropus annulatus*," the common cattle tick, or fever tick, which has been and is costing the country so much.

The cattle tick is not a dipterous insect; in fact, is not a true insect, like those we have just been discussing. That is, it does not have any wings, "but it gets there just the same." It belongs to the order acarina, and the family ixodidæ, and is the most important tick attacking cattle in North America.

As there is a large amount of available literature concerning this pest, it seems unnecessary to go into detail regarding it. Suffice it to say that the eradication of this tick from the southern states is, perhaps, the greatest agricultural and industrial problem before the people of that section of the country to-day. That it can be accomplished is evidenced by the large amount of territory already cleared of ticks and in the free area through the co-operative effort of federal and state authorities, aided

by the dipping vat and the standard arsenical solution. Or, as some of our poetic veterinary inspectors have rhymed it:

"The dipping vat's the famous trick
To eradicate the cattle tick."

It is a practical proposition and only needs money to make it an absolute success. And the more money appropriated by Congress and the different states affected for this work the sooner will we have a tick-free country, with the most profitable markets free and open to the product of every section of it, without let or hindrance.

This will not only benefit the southern section in having an open market, but it will open up a vast rich cattle-raising country which will have to depend, for some time to come, upon the northern breeder of pure-bred animals to supply the demand for improved breeding stock, and it will also open up a rich field for a largely increased number of members of the veterinary profession.

The last Congress appropriated \$250,000 to cover the federal government's assistance in this work, and it is the desire of those interested in this great uplift for the South to make an appeal, through every available and appropriate channel, to the present Congress to increase the amount to \$400,000 for the coming season.

I do not know of any investment that Congress could make that would give to the country such valuable returns, and if not out of place here, I would like to suggest that the Illinois State Veterinary Medical Association pass a resolution recommending that Congress appropriate at the present session \$400,000 to further facilitate the work of tick eradication in the infected area of the country.

KENTUCKY VETERINARIANS HOLD SUCCESSFUL MEETING AT LEXINGTON—Too late for publication in this number, we received from Secretary Robinson, of the Kentucky Veterinary Medical Association, a report of a very successful meeting at the State University, which we will publish in our next issue.

MATERIA MEDICA—PROBLEMS AND PROGRESS.*

BY GEORGE JUDISCH, PROFESSOR OF PHARMACY, IOWA STATE COLLEGE,
AMES, IA.

The days of faith and mystery are, very happily, passing into medical history. Competent and careful practitioners no longer accept authority without the facts. Chemical analysis and pharmacologic investigation have confirmed or condemned the reputation of many an agent employed in the healing art.

The therapeutic nihilist is rapidly passing away because investigation and experimentation, laboratory and clinical, have proven the potency and value of many drugs.

Some years ago the medical profession insisted that prescriptions or proprietary compounds should be pleasing to eye and palate. This desire for pharmaceutical elegance, associated with the ancient idea that a "mixture" exercised some subtle influence, caused the market to become flooded with many more or less useless products. That influence has left its mark on our present pharmacopoeia. Practitioners employing their highly exploited and wonderfully compounded products were disappointed with results and "therapeutic nihilism" was the natural outcome.

Pharmacology is lighting the way to rational medicine. It enables us to separate the grain from the chaff. Being able to select the useful and reject the less useful or useless it seems high time that the veterinary profession adopt the system proposed by a committee of the American Medical Association. This committee suggests, and the suggestion will doubtless be adopted, that only the most useful drugs be included in the materia medica or pharmacodynamics course. In this way the student would acquire a thorough knowledge of his remedial agents, whilst at

* Presented to the twenty-fifth annual meeting of the Iowa Veterinary Association, at Ames, November 12, 1912.

present, being obliged to give consideration to a large number in order that he may pass state and other examinations, he has little more than a conversational knowledge of them. We all know that the average doctor limits himself to 20 or 25 drugs, in fact, very few employ that number. Why befog the student's mind with a long list of diuretics, diaphoretics, etc., when two or three will meet all indications? Why teach slightly efficient when we have highly efficient products? Whilst thinking of efficiency and potentiality let us devote a few moments' consideration to "new products," "less toxic," "more efficient" products than the old standards. A bee without a stinger is a drone. A toxic drug, or one producing unpleasant symptoms, when presented in a new form that will not produce those symptoms has been partially or completely robbed of its efficiency.

Iodides are iodides, salicylates are salicylates and if administered in an assimilable form will produce their characteristic effects. If they do not produce these symptoms they are lacking in iodine or salicylic acid contents.

Ethpharmaceutical products having value and lauded by enterprising manufacturers will, upon close investigation, prove to owe their virtue to an old and time tried drug. You will observe that the formula, if printed on the package, mentions drugs with which you are unfamiliar. In order to add to the mystery and the more thoroughly befog the doctor, the full botanical names are usually expressed. If the product, by way of illustration, happens to be a blister you will, upon strict search, find that the really active and valuable ingredient is your old friend red mercuric iodide.

Why pay an extravagant price for a product that you can prescribe or dispense at a nominal figure? It is the doctor's duty to restore his patient to health as quickly, as safely and as cheaply as the nature of the case will admit.

The following is a partial quotation from a letter published in the last number of *The Journal of the American Medical Association*. "It seems as if there were a large percentage of the profession waiting for some salesman to come along and hand him

green or pink pills, telling him that they are good for almost everything, from nephritis to the vomiting of pregnancy, and explaining how much more cheaply than the other fellow he can sell to you———. It seems as if the average physician could not say 'no' to these semi-patent medicine agents, and this accounts for the number of thrifty proprietary houses which are supported by the 'gullible doctor.' If the average man will just 'mix a few brains' with his prescription work and not depend on the inert proprietary drug, but insist on his prescription being filled with drugs from a reputable house, 'I feel sure that more of us would have much faith and better results in our drug therapy.'

No new drug has, within the last year, illuminated the medical sky with its achievements, yet there is progress to report. There is as much advancement in ascertaining that a drug is inert as there is in adding a new one to our already long list of remedies. Within the last year Dr. Hatcher, if my memory serves me rightly, an eminent pharmacologist, reported his pharmacologic investigations of *cactus grandiflorus*. In order that his research might be as free as possible from errors, he requested a botanist of high standing to collect a quantity of the plant. It was carefully preserved, extracted by competent men and the alcoholic extract administered, hypodermically, to cats, dogs and guinea-pigs. He also, at the same time, injected into a control animal a hydroalcoholic liquid containing the same percentage of alcohol as the extract of *cactus grandiflorus*. The kymographic readings were identical. He then prepared an extract, in vacuo, so as to eliminate the alcoholic influence. If my memory serves me rightly the quantity of solid extract injected into a cat was 6 drams. Proportionate quantities were used in the same way on other animals with uniform results; absolutely no influence on the heart. This product was introduced into medicine about thirty years ago and it was claimed by some that it possessed all the heart tonic properties of *digitalis* without any of its disadvantages. Dr. Hatcher's careful and thorough pharmacologic investigation has proven it worthless and, as Dr.

Hatcher in his article stated, is interesting only in the fact that it is absolutely worthless.

A product quite generally employed in human medicine with favorable results that might prove of value in veterinary medicine is hexamethylenamine, also known as hexamethyltetramine, urotropin, formin, aminoform, cystogen. This product is found on the market as a white crystalline powder and is obtained by the action of formaldehyde upon ammonia $.6\text{CH}_2\text{N}_4$. It is freely soluble in water and the slightly bitterish sweet taste is imperceptible if properly administered, dissolved in 8 to 16 ounces of water. Prof. A. Nicolaier, of Berlin, introduced this product into therapeutics and recommended it as a urinary antiseptic, and it heads the list in that class of remedies. Formin, at body temperature, is gradually decomposed in the stagnant fluids of the body, formaldehyde being liberated. The decomposition is more rapid if the fluid, as urine, is acid in reaction, but it exercises a decided bactericidal influence if decomposition does not occur. It is alkaline in reaction, but in some way, not as yet understood, causes an alkaline urine to become acid. Cases have been reported of its administration before operation on the brain with decided benefit due to its antiseptic influence on the cerebrospinal fluids.

Dr. Zak was impressed with the scanty bacteriologic findings in the rusty sputum of a pneumonic patient who had been given hexamethylenamine in the treatment for another affection. The same writer found that the drug is eliminated in the saliva and bronchial secretions.

Dr. Crowe states that the following conditions may be favorably influenced by the administration of formin. Infections of the genito-urinary tract and typhoid bacilluria. Infections of the bile ducts and gall bladder. Infections of the cerebrospinal system as epidemic meningitis, meningeal infections following injuries or infectious processes elsewhere in the body. Infections of the respiratory tract, including infections of the paranasal sinuses and ears, acute rhinitis and some forms of bronchitis.

Casper injected formin under the skin of a rabbit and found

formaldehyde in the blood. This is the only experiment on animals that I have been able to find, but the drug certainly is worthy of a thorough trial by veterinarians.

Sulphocarbolates.—At the last meeting of the society the sulphocarbolates were highly recommended as intestinal antiseptics by several members. At the time of the discussion it seemed to me that these products were credited with a value they do not possess and I decided to inquire into the subject. The three sulphocarbolates usually employed are those of potassium, sodium and zinc, the latter two being official in the U. S. P. They were, at one time, employed in a limited way as intestinal antiseptics in human medicine, but were soon abandoned as ineffective. I quote the following from Dr. Torald Sollman, Professor of Pharmacology and Materia Medica in the Medical Department of Western Reserve University: "The great toxicity of phenol, its very pronounced local irritant action, and its rapid absorption, all lessen very greatly its therapeutic value, and active search has been made for compounds devoid of these undesired properties. The following methods have been tried. By substituting an acid radicle for an H in the C^6H^5 of the phenol relatively non-toxic compounds are produced. Such are the phenolsulphonates. This combination is, however, useless, since it destroys the antiseptic power as well." Dr. Arthur R. Cushny, Professor of Pharmacology in the University of London, has the following to say regarding sulphocarbolates: "The sulphon group lessens the toxicity in the same way as carboxyl and the sulphocarbolates or para phenol sulphonates are therefore less poisonous than carbolic acid. The sulphocarbolates of sodium and zinc have been used as external antiseptics, and the sulphocarbolate of sodium has been administered to arrest fermentation in the stomach. The zinc salt possesses some astringent action and has been used with good results as an injection in gonorrhœa. The sodium salt is probably excreted in the urine unchanged." Dr. H. C. Wood, Jr., Associate Professor of Pharmacology, University of Pennsylvania, in Wood's Therapeutics: "Both the sodium and zinc salts sulphocarbolates are official in

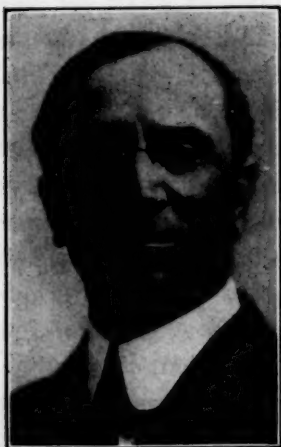
the U. S. P. The sulphocarbolates were introduced some years ago as intestinal antiseptics, for which purpose it was evidently expected they would possess the antiseptic virtues of carbolic acid and the innocuousness of the sulphocarbolates. It has been shown, however, by Withers that they are not possessed of any direct antiseptic power. More recently it has been claimed for them that they are decomposed in the intestinal tract with the liberation of carbolic acid, but we know of no experimental or scientific evidence tending to show the truth of this belief, and their value is extremely doubtful." You will observe that authorities are agreed that the sulphocarbolates are not decomposed in the intestinal tract, the chemical bond between the sulphonic acid and base being a strong one. It is my understanding that the usual dose for a hog is 30 grains or $\frac{1}{2}$ dram. For purpose of argument we will say that the product is decomposed and grant for the time that absorption does not take place. The decomposition would result in soda sulphate and phenol. Thirty grains composed of equal parts of the sulphocarbolates of potassium, sodium zinc would, upon decomposition, liberate 11 52/100 grains of phenol. According to Fred Smith's *Veterinary Physiology* the average bowel capacity of the pig is 5 9/10 gallons. This would if absorption did not occur and the phenol were uniformly distributed throughout the intestinal tract result in .015 of a grain to each fluid ounce.

Bacteriologists tell us that a solution of 1/400 of phenol exercises some influence on bacteria, but weaker solutions do not. A solution of .015 of a grain of phenol to one fluid ounce will result in a solution of approximately 1 in 30333.

Sulphocarbolates were highly recommended for hog cholera at last year's meeting. You will observe from the foregoing that if decomposition did occur the resulting antiseptic action would be a negligible quantity. We must remember, however, that hog cholera virus is unusually resistant to antiseptics. Uhlenhuth reports the following results from numerous experiments with hog cholera virus: 5/10 per cent. solution of phenol did not destroy the virulence of the virus after twelve days. A 1 per

cent. solution did not affect the virulence in four days and a 2 5/10 solution did not affect the virus in three days. In another experiment it did not affect it in thirteen days. He then employed a 3.3 per cent. solution with negative results. In view of these facts the original conclusion that sulphocarbolates are worthless as intestinal antiseptics must stand.

EARNESTNESS OF PURPOSE AND PROFESSIONAL EFFICIENCY RECOGNIZED BY GOVERNOR OF MAINE.—Dr. Achilles Joly, of Waterville, Maine, has recently been appointed Live Stock Sanitary Commissioner of that Commonwealth by Governor William T. Haines, and it is needless to add



DR. A. JOLY,
Live Stock Sanitary Commissioner. Augusta, Me.

that the appointment meets with the hearty approval of the Maine veterinarians, as Dr. Joly is highly esteemed by his colleagues, who on three different occasions have elected him president of their state organization, of which he was one of the founders in 1893, and has held about all the offices in it at one time or another. The doctor is also an old member of the A. V. M. A., and represents his state in that organization as resident state secretary. He has always been an active worker along the lines of sanitary medicine, is a member of the Central Maine Anti-Tuberculosis Society, of Sidney Grange, and Patrons of Husbandry. His ambition for the uplift of his profession in his state found vent in the active part taken by him with his fellows in organizing the State Board of Veterinary Examiners, and in his services as secretary of that board during the past eight years since its organization. The REVIEW congratulates Dr. Joly on the recognition of his worth shown him by his state after twenty-three years as a veterinary practitioner there, and congratulates still more the veterinary profession and live stock owners of the state of Maine in having Dr. Joly to direct so important a branch of agriculture.

DR. JOHN MCCARTNEY, for some years assistant to Dr. E. B. Ackerman, Brooklyn, has located in Middletown, N. Y.

FIXED HOG CHOLERA VIRUS.*†

BY JOHN REICHEL, GLENOLDEN, PA.

Hog cholera is at present correctly classed as one of the invisible-virus diseases. Little has been added to the work of Dorset, Bolton and McByrde (1) in which they proved the specificity of the virus. Aside from knowing that it is invisible, filterable, demonstrable only by injecting suspected material into susceptible hogs, easily destroyed by heat and unusually resistant to some of the well-known disinfectants we have no clue to its real nature. The work of Dinwiddie (2) presented at the forty-ninth annual meeting of the American Veterinary Medical Association encourages the hope that the tissue-element, the red blood corpuscles, of the hog may perhaps be demonstrated as the host of the specific cause.

Judging from the natural outbreaks of the disease the variation in the virulence of virus is a very important characteristic, upon which preventive measures including the success in the immunizing and curative treatment with hog cholera serum largely depends. In preparing virus or virulent blood for 1,181 hyperimmune hogs, 1,964 supposedly susceptible hogs were injected subcutaneously with from 2 to 5 c.c. doses of virus, and only 144 or 7.3 per cent. resisted infection. The 1,720 or 93.7 per cent. all developed the disease in less than 40 days.

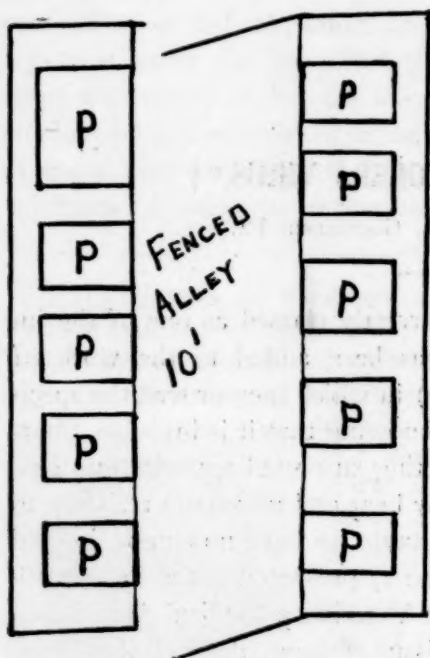
The virus hogs were kept in regulation virus pens, 8 by 10 feet, elevated 18 inches from the ground on four legs, waterproof

* Read at the meeting of the United States Live Stock Sanitary Association, December 4, 1912.

† Published in the *Journal of Infectious Diseases*, January, 1913.

(1) Dorset, Bolton and McByrde, B. A. I. U. S. Dept. of Agric. Bulletin No. 72.

(2) Dinwiddie, Report of the 49th Annual Meeting of the American Veterinary Medical Association.



OUTLINE OF VIRUS-PEN ENCLOSURE.

metal lined floor, slant roof, both sides solid, small narrow drop door for ventilation in back, with door and two window in front. Each pen is equipped with a wooden feeding trough and card holder to accommodate a card for each hog. The pens are placed in two rows of five each, from 4 to 5 feet apart. The two rows are separated by a fenced alley approximately 10 feet wide. The group of pens in turn is surrounded by a fence which prevents all communication from pen to pen except by the doorway of each pen.

Although 19 strains are listed in Table No. 1 not all of the strains were continually passed through susceptible hogs. No more than six were passed through hogs in the virus pens at any one time. The table records 13 separate, but not consecutive months. In fact a number of the strains listed were acquired several years ago, and when not passed through hogs during any one month the "seed" of the strain was kept in sealed bulbs at a low temperature; the month was not counted in the tabulation. A strain passed through hogs during a number of separate but not consecutive months was injected into not less than one lot of hogs each month and during that month the strain may have been passed through two or more hogs. Although the hogs were injected for the chief object of producing virus or virulent blood for the injection of hyperimmune hogs every effort was made to increase the virulence of the strains and to keep them pure, so that the stronger would not supplant the weaker. All the hogs for the production of virus were purchased by one who was thor-

TABLE NO. I.

Passage of Hog Cholera Virus Through Susceptible Hogs.

Virus.	Source.	First Month.	Second Month.	Third Month.	Fourth Month.	Fifth Month.	Sixth Month.	Seventh Month.	Eighth Month.	Ninth Month.	Tenth Month.	Eleventh Month.	Twelfth Month.	Thirteenth Month.
V1. North Dakota..		⁴⁶ 19.5	²⁹ 10.9	⁵⁴ 7.7	⁴⁹ 7.5	³⁷ 11.5	¹¹ 17.8	¹⁴ 7.6	⁹ 9.7	⁶ 11.3	..	..	..	..
V2. Minnesota		²¹ 7.2	⁵ 8.8	⁴⁹ 9.3	³⁶ 5.4	³⁰ 7.1	¹² 7.7	¹⁰ 7.1	¹⁷ 10.6	¹⁶ 6.7	..	..	..	..
V3. Pennsylvania ..		⁴³ 19.4	⁶ 4	³ 10.3	¹⁶ 7.2	²⁹ 6.5	¹⁰ 6.4	⁴ 7.2	⁸ 9.3	³ 10.3	..	..	..	..
V4. Pennsylvania ..		⁶ 14.4	⁶ 8.6	⁷ 6.4	⁹ 5.9	⁸ 5.5	⁸ 9.2	⁵ 8	³ 6.6	⁶ 5.6	..	..	..	..
V5. North Dakota..		⁸ 12.1	⁸³ 12.2	⁶ 19.5	¹ 15	¹² 9.9	⁵ 6.6	⁵ 11.2	⁶ 7.5	..	..	..	..	..
V6. Ohio		⁶ 17.6	² 8.5	¹⁸ 9.2	⁷ 10.2	² 6.5	⁵ 6.6	⁵ 5.2	..	..	..	..	..	..
V7. Pennsylvania ..		⁴ 7.7	..	..	..	..	..	..	..	..	..	..	..	..
V8. Minnesota		¹ 8	⁹ 7.8	..	..	..	..	..	..	..	..	..	..	..
V9. Minnesota		⁵¹ 8	¹⁵ 6.3	..	..	..	..	..	..	..	..	..	..	..
V10. Minnesota ...		⁷ 6.8	..	..	..	..	..	..	..	..	..	..	..	..
V11. Delaware ...		²⁹ 40.1	²⁸ 27.1	¹⁸ 10.3	³¹ 11.2	¹⁶ 9.4	..	..	..	..	..	..	..	..
V12. Ohio		⁵ 14.2	⁴ 15	..	..	..	..	..	..	..	..	..	..	..
V13.		²⁵ 30.1	⁶⁴ 21.2	¹¹ 20.5	¹⁶ 30	²⁵ 36.2	⁴ 12	⁵⁹ 13.4	¹ 5	¹⁸ 19.2	¹⁷⁹ 11.4	¹²¹ 20.4	¹²⁰ 14.1	³⁷ 21.3
V14. Pennsylvania .		³ 22.3	..	..	..	..	..	..	..	..	..	..	..	..
V15. Kansas		¹¹ 8.5	⁵⁸ 9.2	¹¹ 7.8	..	..	..	..	..	..	..	..	..	..
V16. New Jersey ..		¹⁵ 14.2	..	..	..	..	..	..	..	..	..	..	..	..
V17. New Jersey ..		²⁰ 10.2	..	..	..	..	..	..	..	..	..	..	..	..
V18. Missouri		² 6.5	..	..	..	..	..	..	..	..	..	..	..	..
V19. Missouri		⁶ 9.6	..	..	..	..	..	..	..	..	..	..	..	..

* Number of susceptible hogs injected.

† Average number of days in which hog cholera was developed before killed for virus or died.

oughly familiar with our needs. That they should be corn-fed and from hog-cholera-free sections of the country where chief requisites, that susceptible hogs were supplied is known by the fact 93.7 per cent. succumb. If, as happened several times, there was reason to believe that the hogs were infected upon arrival, no "seed" was saved to carry the strain from the suspected lot.

Upon the arrival of a lot of hogs for the virus-pens, each hog was injected with from 2 to 5 c.c. of the seed-virus, and placed in the virus-pen assigned to the strain. The pens were not cleaned during the time each lot of hogs were kept in them. Grain was fed twice daily and water placed in the feed troughs without entering the pens. Temperatures, however, were taken daily and recorded. This was usually entrusted to one man who went from one pen to the next. Therein lies the possibility that infection was carried from one pen to the other, but a careful study of the tables show that any increase in virulence was gradual. Moreover the care exercised in selecting the strain for "seed" reduced to a minimum the possibility that a weak strain was supplanted by a stronger.

According to this the 19 strains had their origin in natural outbreaks in 8 States. The top figure in each square opposite the number of each strain includes the number of hogs injected during each month; the lower figure gives the average number of days from the time the hog was injected until the disease had sufficiently developed for us to kill the hog for virus or virulent blood. Sudden deaths, before the hog was bled, are included as hogs killed.

With the exception of virus No. 1, the strains show a gradual increase in virulence, and we believe that we have had some of the strains under observation sufficiently long for us to regard them as having attained the maximum virulence possible—in other words, that these strains have or are rapidly approaching what Pasteur, working with rabies virus, called a "fixed virus." These strains are capable of producing the first symptoms, loss of appetite, occasionally reddening of the skin, and temperature-rise on the fifth or sixth day, with death on the seventh or eighth

day as a direct result of the injection subcutaneously in 2 to 5 c.c. doses. The hogs killed in less than 5 days, included in the table, were probably of the small class infected before arrival.

It is interesting to note at this time that fixed rabies virus will bring about symptoms of the disease in rabbits following subdural injection on the sixth or seventh day, and death on the eighth or ninth day. The period of incubation of fixed strains of the so-called invisible viruses may be quite similar in length.

The virus or virulent blood collected from 1,720 hogs was entirely used up in hyperimmunizing 1,181 hogs, of which only 6.7 per cent. received one or more intraperitoneal injections, and 2.7 per cent. one or more subcutaneous. All the injections were made intravenously except in the percentage referred to, when intraperitoneal or subcutaneous injections were alone possible.

Virus propagated in the manner outlined above and injected intravenously will yield a uniformly potent serum, as has been proved by the accepted standard test of injecting 6 susceptible pigs each weighing not less than 50 pounds with 2 c.c. doses of virus, fixed virus being invariably used; 2 are then injected with 15 c.c. and 2 with 20 c.c. doses of the serum under test, and 2 are left untreated with serum, to serve as controls or checks on the virulence of the virus used and the susceptibility of the pigs. The virus used should kill the controls in at least 21 days, while the serum should save pigs treated.

DR. RUTHERFORD ON THE JUDGES' STAND.—In scanning the pages of the January number of *Bit and Spur*, we were pleased to observe a striking likeness of our good friend Dr. John G. Rutherford, standing in an easy, happy attitude upon the judges' stand at the Ottawa Hunt Club race meet. The doctor was the center figure of a little group, with His Royal Highness the Duke of Connaught on his right; Mr. T. C. Bate, on his left, and Dr. R. E. Webster, M.F.H., to the right of the Duke.

REPORTS OF CASES.

POLIOMYELITIS IN THE HORSE?

By JOHN F. WINCHESTER, Lawrence, Mass.

On the 13th of October, 1912, a dog owned by Mr. E. A. K. made the acquaintance of a skunk. For a few days before this he did not act natural. He was about five years old, very fat, had been in the family since a pup.

The dog officer was called on the 14th and found him weak in the hind legs, but would stand and walk, although he did not have full control of the legs. Would respond to the call of the owner. No salivation, no snapping, not vicious, swallowed normal. When placed in the wood-shed, he did bite the door jamb and barked. When urinating he squatted like a pup. Did not in any way act excited, and did not rest when lying down; was uneasy.

The officer informs me that there were no symptoms to cause him to suspect rabies. When the officer gave him cyanide, he held the dog's mouth open with his bare hand. The officer was sent for, as the owner thought the dog had been poisoned, and the odor of the skunk was very marked.

After disposing of the dog, the owner was anxious to know if a disease in a dog could be transmitted to the horse. The officer said such could occur if the horse was bitten, especially if the dog had rabies. This opinion led to an examination of the horse, which was frequently loose in the yard, and barb wire was on the fence, and they found a scratch about the center of the upper lip, and superficial. The scar was about one inch long, and the owner considered this due to the barb wire.

The horse in question began to manifest symptoms that were first noticed soon after the dog was killed.

Mr. and Mrs. K. told me they were not sure that the dog bit the horse, which confirmed what the officer had told me.

This interesting case forms part of a report to the Director of the Department of Public Health and Charities of Lawrence, Mass., by Dr. John F. Winchester, in the capacity of Inspector of Animals of that city; and seems to point to the importance of microscopical examinations of the central nervous system, where clinical symptoms seem to indicate derangement of the nervous system.—[Ed.]

As described by the owner to me, the horse would drive sideways, stagger, was languid and at times excited. These symptoms continued up to and including the week of November 3, 1912, when, in addition to the above, he would snap his teeth, salivate and drag both hind feet. About one week before the horse was shot he was newly shod, and then the toes of both hind-feet were worn so much as to attract attention.

The last week of his life the symptoms remained the same, although more marked, especially as regards the wearing of the toes of both hind hoofs and shoes. The owner informs me that he would carry his head high and, when left near a post, would rub his face. He drove him for the last time on the 15th of November, and then took the precaution to tie him, the first time in three years. This day he rubbed the side of his head severely and bit the rope in two.

The following day he became very excitable, hitting his head against the side of the stall, and was unsafe to approach or care for.

REPORT FROM THE PATHOLOGICAL LABORATORY, MASSACHUSETTS GENERAL HOSPITAL.

Report of Microscopical Examination of Paraffin Sections from the Cerebral Cortex, Cerebellum, Medulla and Cervical Cord of a Horse for Dr. J. F. Winchester.—Sections from the medulla show much cellular infiltration of the adventitial lymph spaces of many of the blood vessels, and also aggregations of cells about some of the large nerve cells. Degenerative appearances in the nerve cells are not well marked.

Sections from the cervical cord also show cellular infiltration of the adventitial lymph spaces of the blood vessels, both in the gray and white matter, and also striking lesions in the gray matter, especially in the anterior horns. These lesions are in the form of foci of cellular infiltration, occupying areas several times the diameter of a large nerve cell. In the midst of these foci, nerve cells may be seen. In one of them a large nerve cell is present, showing hyaline changes, an irregular outline, and indentations produced by the cells which surround it.

The cells infiltrating the adventitial lymph spaces and aggregating about the nerve cells and in the foci in the cervical cord are of several kinds. Most of them cannot be distinguished from small lymphocytes; some have resemblances to plasma cells; some are larger and apparently represent the polyblasts of Maximow.

Their nuclei are often fragmented. No polymorpho nuclear leucocytes can be positively recognized.

Sections from the cerebral cortex and cerebellum show no definite lesions.

No signs of meningeal inflammation observed in any of the sections.

Negri bodies so characteristic of rabies are not to be found in any of the nerve cells.

It is impossible to make a definite diagnosis from these findings. While lesions similar to these have been described in rabies, they have been shown not to be diagnostic of that disease, but to occur in other diseases as well, especially in the acute stages of poliomyelitis. The absence of Negri bodies points strongly against rabies, but does not absolutely exclude it. The similarity of the lesions in these sections to those found in poliomyelitis is very striking, and the possibility should be seriously considered that this is a case of that disease in a horse, although the spontaneous occurrence of it in this or any other animal is not yet recognized.

(Signed) JAMES HOMER WRIGHT.

TRAUMATIC PERICARDITIS.

By BRUCE M. WALLACE, D.V.M., Bergen, N. Y.

On the morning of June 5th I received a call to come and see a cow, which the owner said was off her feed. It was only a short distance from town, so I was not long in getting there. On arriving I found a fine specimen of a Holstein cow, 8 years old and weighing about 1,000 pounds, standing in a stanchion, with the nose resting on the floor; respiration 25, temperature normal, pulse 60 and intermittent. A swelling was noticed between the rami of the inferior maxillary bone, and also a swelling of the dew-lap, which would pit on pressure. Auscultation over the heart revealed a gurgling sound. Appetite was just fair, and the animal in good condition. The case was diagnosed as one of traumatic pericarditis, telling the owner that treatment was useless, and that the cow could then be used for food. He doubted my diagnosis and wanted her treated. I complied with this request, giving 1½ pounds magnesia sulphate, applied mustard to the sides and put the patient on a good tonic. I again advised the owner to butcher her, informing him she would be dead in four weeks. She lived five weeks, and I asked

him if he would let me know when she died, which he did, and I went to his place and held a post mortem. I placed the animal on her back, removed both of the fore-legs just as close as I could to the ribs, then took out the ribs, opening the entire thoracic cavity without disturbing the diaphragm. I then took a large knife and followed down the anterior surface of the diaphragm about half-way, when the knife struck something gritty. I told the farmer there was his nail or piece of wire, whichever it may be; and he pulled it out himself—an eight-penny finishing nail. He believed now what he doubted before. The pericardial sac was as large as a half-bushel basket and filled with a dark colored fluid; the heart was soft and flabby, and the tube through which the nail worked contained a very thick pus. The lungs were also inflamed, but all other organs normal.

THE CORNELL VETERINARIAN, Vol. II, No. 2, reached us early in January, and in addition to some excellent moral teaching and other valuable matter editorially, contains some excellent articles by prominent members of the profession, the name of Dr. David W. Cochran, President New York State Veterinary Medical Society, heading the list.

HORSEMEN AND VETERINARIANS CO-OPERATE TO SECURE STALLION REGISTRATION LAW.—The following clipping from the *Breeders' Gazette* suggests a co-operative spirit between the veterinarians and the horse breeders in Oklahoma. "In recent years Oklahoma has been a dumping ground for scrub stallions and quack veterinarians. Owing to the laxity of the laws in that state there has been no way to prevent this unfortunate condition. The legislature convened January 7. An effort will be made by Oklahoma horsemen and veterinarians to secure the passage of a stallion registration law, patterned after the ones which have been so successful in checking the use of unsound and badly bred stallions in the North. The State Veterinary Medical Association, of which C. E. Steel, Oklahoma City, is secretary, will also push a bill for the protection of the qualified veterinarian. These measures deserve support because they look toward improvement in horse breeding, and a higher grade of professional assistance for stockmen."

DISTINGUISHED VISITORS.—On December 31 we were honored by a call from President John R. Mohler, of the A. V. M. A., and Dr. John Reichel, of Glenolden, Pa., the gentlemen being in attendance at the meeting of the Society of American Bacteriologists, which was then in session in New York City.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

CASE OF DOUBLE ILIAC THROMBOSIS [*W. Hunting, F.R.C.V.S.*].—The record of a bay gelding, which having exhibited all the evidences of this affection, was destroyed and presented at the postmortem the following conditions: Heart appeared a little larger; circulatory system free from parasites; thrombosis commencing about 1½ inch in front of the origin of the external iliac; the artery on the off side was most seriously involved, and in it the thrombosis could be traced down the leg to where the femoral artery crosses the shaft of the femur. A similar condition was also found on the artery of the opposite side. The internal iliacs were thrombosed on both sides, but that of the right side the most extensively. All the branches given off from these two vessels were also diseased. Likewise was the middle sacral.—(*Vet. Record.*)

LESIONS ON PENIS OF STALLION [*J. H. L. Lyons, M.R.C.V.S. and R. P. Jones, M.R.C.V.S.*].—Entire chestnut is reported having sores and ulcers on the penis, observed during copulation. There is no swelling nor heat of the sheath. When the penis is extended or in erection there are on the anterior fourteen inches about, of the near side, some vesicles and ulcers. The glans penis is normal. No trouble in micturating. The vesicles contained clear fluid. The ulcers are shallow and contained little yellow pus. Dourine was suspected. But as the fore legs had been blistered some days before, and as there were no cutaneous plaques, and a negative microscopic examination of the blood, the case was considered as due to brushing of the penis against the blister. In thirty-six hours every bad symptom had disappeared.—(*Vet. Record.*)

ENORMOUS RENAL TUMOR OF A HORSE [*S. J. Hewitt, M.R.C.V.S.*].—Concise record of a case of colic in a mare, which had died and where at the postmortem an enormous tumor was found under the right side of the loins, involving and com-

pletely surrounding the kidney. It weighed exactly 106 lbs. The specimen proved to be a neuro-carcoma.—(*Vet. Journ.*)

INTERESTING FRACTURE OF THE TIBIA IN A MARE [*W. Lothian, M.R.C.V.S.*].—Mare is very lame, because of a kick on the inside of the leg, although there was no mark. Fracture without displacement is diagnosed. The animal is put and remained in slings for five or six weeks. When taken out and walked, there was noticed a certain abnormal movement. After some time, the mare was put to grass but yet remained lame and entirely unfit for use. She was destroyed. The postmortem revealed a "fracture involving the joint, and consists of the anterior tuberosity for 6 inches or so down the bone and embracing nearly one-third of the surface of the bone." Great deal of fibrous tissue had formed and held the fractured part in position.—(*Vet. Journ.*)

SEPTIC METRITIS FOLLOWED BY RENAL ABSCESS [*E. Wallis Hoare, F.R.C.V.S.*].—Great Dane bitch had a litter of fourteen pups. Four days after had one more dead. This is followed by symptoms of illness with a temperature of 106° F. Tense abdomen, frequent straining, abundant stinking vaginal discharge; vaginal examination negative. After two days a deformed, decomposed pup is got rid of. A slight improvement is the result, but soon the rigors returned and the temperature goes up to 107° F. Antistreptococcic serum is given. Uterine disinfecting injections are kept up. Then came up a series of fluctuations in the temperature. The slut began to pass blood in clots when urinating, she lost considerable flesh, showed loss of power behind and was destroyed. *Autopsy*: The left kidney was enlarged and was tumor-like. A large abscess existed in the cortex containing a great amount of bright green pus. The kidney weighed 10½ ounces. The right organ was also enlarged and weighed 9 ounces and 2 drachms. The uterus showed thickening of the mucous membrane.—(*Ibid.*)

SARCOMA OF THE OMENTUM IN A SPANIEL [*By the same*].—Six-year-old, small sized spaniel bitch has lost condition and gradually her abdomen has grown larger. It is indeed much distended and looks ascitic. Puncture of the abdomen gives free hemorrhage. Destruction was advised. A tumor was found in the abdomen filling up the entire abdominal cavity, the viscera being pressed upwards towards the spine. The tumour was movable, soft in consistency, and weighed 3 lbs. 7 ozs.

There were also small white growths on the peritoneal surface of the diaphragm and on the spleen. The neoplasm proves to be a round-celled sarcoma of the omentum.—(*Ibidem.*)

FOOT AND MOUTH DISEASE IN INDIA [*E. W. Oliver, Super. C.V.D.*].—That disease is known in India by many names, among the chief being Khur-pakka, Nuh-pakka Khura, Bekhra, Chhapra-pakka, Khoosita, Pairana. As the relative price of cattle is so small there is no need for the serious view of the matter as necessary at home. Animals are treated with sulphate of copper baths, through which they are driven twice a day. The mouth is washed with alum, borax and carbolic acid. When the feet are first affected, to prevent the mouth becoming infected, the feet are encased in leather bags to prevent rubbing the vesicles with the lips and gums. Foot and mouth disease is almost constant in India, and is not treated as a serious disease by the owner except at the busy time of harvest, when working oxen may be put out of action.—(*Vet. Record.*)

ASCARDIES SUILLOE IN THE PERITONEAL CAVITY [*R. Bennett*].—A ten or eleven weeks' old sow, in good condition, seems not to be very well, refused her food, and is found dead the next morning. On opening the abdomen a dozen or so of worms *Ascarides Lumbeicoides*, in the peritoneal cavity. They were alive and distributed all over the abdomen, some between the coils of the intestines, one was on the posterior face of the liver. There was lesions of general peritonitis with deposits of yellow lymph-like exudate. The intestines were much inflamed and all the coats thickened. No perforation was found to explain the exit of the worms from the intestinal canal.—(*Vet. News.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

DIAPHRAGMATIC HERNIA [*Mr. Bigot, Army Veterinarian.*]—*Violent*, gelding of 11 years, has intermittent colic which lasted several days. After two weeks, the respiration is accelerated, auscultation and percussion are negative, except some dullness on the left side, with hypersensibility of the costal wall. Exploration with puncture is negative. *Violent* borborygms are heard in the thorax, and diaphragmatic hernia suspected. This condition lasted for about a month. The attacks of colic are more severe and are not relieved with morphine. Temperature

risers to 39° 2C. The animal dies. *Postmortem*: Two or three litres of yellowish serosity in the abdomen; peritoneum extensively congested. The whole intestinal mass has an abnormal aspect, the coecum is right across the abdomen and is twisted in spire upon itself, the large colon has also assumed a transversal direction; the liver is the seat of a passive congestion, and under its left lobe appears a very large laceration of the diaphragm, running vertically down and measuring 25 centim. Through it the small intestine has passed into the thoracic cavity, congested and of color varying between a bright red tint and a dark purplish gangrenous hue. The stomach and spleen also in the chest are pressing against the left lung, which is squeezed, congested, hepatized here and there. The pleura and pericardium were inflamed. The heart showed lesions of acute endocarditis. *And with all that, the horse lived nearly 40 days.*—(*Journ. de Zootech.*)

SUTURE OF THE LOWER JAW IN A SLUT [*Dr. Roussel*].—Four-year-old slut, weighing 6 lbs., falls down a pair of stairs and breaks her lower jaw, between the last two molars. There is displacement, one segment overlapping the other one-half a centimeter. The only possible treatment is the suture. The slut is chloroformed. The segments of the maxillary are perforated below the last two molars, the pieces of this bone are well adapted together and a big silver wire passed through the drilled holes, keeps them in place. By the next day the little slut can take nourishment, and after fifteen days consolidation is strong.—(*Bullet. de la Soc. Cent.*)

RADICAL OPERATION OF FIBRO SARCOMA OF THE FACE [*By the same*].—Dog five years' old had a fibro-sarcoma of the face. The orbital fossa is partly invaded by the tumour, which, while it projects outwards, has ramifications on the internal face of the superior maxillary and the palatine bone. The last upper left molar is surrounded by neoplastic tissue. There is muco-purulent discharge from the left nostril and left eye. Saving a large fold of the skin, the maxillary sinus was entered and minutely curetted. The left molar extracted, the superior maxillary and palate bone were scraped thoroughly. The large cavity left was packed the first day with iodurated solution and big drainage tube inserted. The nasal discharge stopped immediately after the operation. Cicatrization went on rapidly, and on the 16th day the animal went home cured and without

a-visible mark of the operation. Two months after his health seemed to be perfect.—(*Bullet. de la Soc. Cent.*)

COLO-RECTAL INVAGINATION OF DOG [*Adjunct Prof. R. Lesbouyries*].—This was in a year-old fox terrier. He suddenly stopped eating, vomited, passed bloody feces and his condition alarmed the owner. The dog seems gay, has normal temperature, but the mucosa are pale. The abdomen is slightly painful. The dog remains in its kennel, quiet, but shows himself gay when he is approached. His appetite is gone, the tongue is coated, his walk is staggering. The nausea, vomiting and expulsive straining are gone. The feces remain the same, then he passes blood, mixed with pieces of straw. Rectal examination is negative. The loss of flesh is very great, muscular emaciation well marked. Careful examination of the thorax and abdomen gives no clue to a diagnosis. Death finally occurred without agony. Postmortem revealed lesions of slight colitis and a colo-rectal invagination. Ten centimeters of invaginated organ are of red brownish hemorrhagic color. The mucosa of the rectum was ulcerated on a surface measuring 4 or 5 centimeters.—(*Rev. Veter.*)

GENERALIZED TUBERCULOSIS IN A CALF [*Mr. A. Chaillot*].—A fifteen-day-old calf has a swelling of the left testicular region. It is warm, painless, firm in consistency and movable towards the epididymis. The animal is in good condition, has good appetite, he carries his left hind leg in abduction when walking. Orchitis is diagnosed and prescribed for. After a few days the condition instead of improving grew more serious and the owner decides to send the calf to the butcher.

At the postmortem, besides a marked generalized tuberculosis, a localization of the disease is noticed on the left testicle. All the glands of the body are diseased—the parenchymatous organs are free. The left testicle is three times its normal size. There is no trace of suppuration. The prostate gland was also tuberculous. The tuberculous orchitis has been noticed only once in a boar by Moust. a.—(*Rev. Veter.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

At a recent meeting of the Berlin Academy of Sciences, Professor Orth discussed the question of bovine and human

tuberculosis. The progress made in the direction of research work, the relation between human and bovine tuberculosis was described and demonstrated. Facts were brought forth to show that the number of human beings infected through the bovine bacillus was very large; that from the standpoint of human pathology and hygiene, some means should be adopted for the eradication of bovine tuberculosis. This line of work should be directed chiefly against the bacterium in food stuffs, particularly that derived from tuberculous sources. According to Orth, human infection through contact with the organism of pearly disease is much more frequent than can be approximately determined.—(*Berliner Tierärztliche Wochenschrift*, No. 9, 1912.)

BRIEF REPORT CONCERNING PANTOPON [*Veterinarian Nagler Munchen*].—In cases of canine distemper, attended with intestinal and gastric complications, the author injected an opium preparation, "Pantopon." Small dogs were given 0.1 to 0.2 grams of a two per cent. solution subcutaneously; large dogs were given proportionately larger doses, 0.5 grams. When the maximum dose was administered, and in some instances after the first injections were made, vomiting was produced, but this did not occur after subsequent doses were given. Two to three injections were sufficient to effect a cure.—(*Münchener Tierärztliche Wochenschrift*, 1911, No. 29.)

THE APPLICATION OF PIX LIQUIDA FOR NAVEL DISINFECTION [*District Veterinarian Bichlmeier of Weiler*].—For many years Bichlmeier applied exclusively pix liquida for navel disinfection. Immediately after birth the navel string was smeared throughout its entire length as far as its entrance to the abdomen with tar for three successive days. The application of tar in every instance averted infection. Excellent results were obtained by the author in this manner in large cow-barns, where for years past great mortality prevailed among calves, owing to infection of the navel, and where all possible experiments failed to eradicate the infection. Since the application of tar was practiced in these barns the evil has entirely disappeared.—(*Münch. Tierärztliche Wochenschrift*, No. 13, 1912.)

DIGALEN, A SPECIFIC IN THE TREATMENT OF HAEMOGLOBINAEMIA OF THE HORSE [*District Vet. Johann Furthmaier in Brixen*].—Furthmaier calls attention to the fact that, according to his experience, digalen has a rapid and effective action not only in severe cases of pneumonia, but also in haemoglobinaemia.

Veterinarian Kofler also corroborates this statement with regard to the action of the drug. Both practitioners prescribed and used digalen in the following manner. In cases of extreme restlessness, with profuse perspiration, a solution containing 0.5 grams of morphine hydrochlorate is injected subcutaneously; after the symptoms of uneasiness subside 15.0 grams of digalen are given subcutaneously. In two or at most four hours after, the horse is able to stand up and remains standing, apparently at ease. Only in rare cases is it necessary to repeat the treatment on the following day. The dark color of the urine disappears gradually.—(*Tierärztliche Centralblatt*, 1912, No. 25.)

OBSERVATIONS AND INVESTIGATIONS CONCERNING INFECTIOUS OTITIS AND OSTEOMYELITIS IN CATTLE AND HORSES [*Dr. Alfred Baumgarten, Interlaken*].—As a result of his observations, the author arrives at the following conclusions:

1st. There occurs among horses and cattle a very painful otitis and osteomyelitis, presumably due to the necrose bacterium alone, or in symbiosis, with a grampositive coccus.

2d. That the same produce a constant state of agitation of a pronounced character, a paralysis with tendency to seek support, frequency of the pulse, and often accompanied by fever.

3d. In some cases abscess formation.

4th. The disease has a most destructive influence on bone tissue without a reactive osteophytic formation. Consequently the regeneration of bone tissue was never observed.

5th. The course of the disease is of a lingering character, and chronic.

6th. The iodine preparations supercede all others in the treatment of this disease.

7th. Up to the present time, these diseases were occasionally considered of a rheumatic nature.—(*Schweizer Archiv. für Tierheilkunde*, LIII. Band, 3. Heft.)

CONCERNING THE ADRENALIN THERAPY IN MORBUS MACULOSIS OF THE HORSE, AND IN PARTURIENT PARESIS OF CATTLE [*By George Lichtenstern in Rottalmunster*].—The author recommends the use of adrenalin in morbus maculosis of the horse. He cites two cases in which repeated intra-muscular injections of 10 c.c.m. adrenalin (1-100) were given in the side of the neck, resulting in rapid recovery. In parturient paresis of cattle the author used adrenalin. In order to effect a cure the infusion

of air must be used freely in conjunction.—(*Münch. Tierärztliche Wochenschrift*, 1911, No. 18.)

A PRACTICAL METHOD OF ADMINISTERING FLUID MEDICAMENTS TO THE HORSE [By Combaret].—The administration of fluid medicines to the horse is always a tedious process, and very frequently the animal refuses to swallow the fluid, so that the greater portion is lost in running out the sides of the mouth. The author describes the method which he has adopted for many years, and which has given him entire satisfaction, as follows: The head of the horse is fastened in the usual manner and held at a proper elevation. The operator stands upon an object of sufficient height to enable him to pour the fluid into the mouth from one side, the neck of the drenching bottle is placed over the tongue; when a sufficient quantity of fluid is in the mouth, and when the horse will not swallow, an assistant pours a small quantity of clean, luke-warm water into the nasal chamber. The water coming in contact with the sensitive nasal mucuous membrane immediately produces a reflex action which results in the involuntary swallowing of the liquid in the mouth. This manipulation is to be repeated until the whole dose is swallowed, and not a drop is lost in consequence. It is important to note that only a small quantity of water is to be used for nasal irritation—about three or four teaspoonfuls. As soon as the animal has swallowed the contents in the mouth, the trickling of the water into the nasal chamber should cease immediately.—(*Berliner Tierärztliche Wochenschrift*, No. 12, 1912.)

ANNUAL SMOKER OF VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.—The popularity of these annual gatherings with veterinarians of Greater New York and surrounding states has pretty clearly demonstrated the need of relaxation of that kind by men closely confined to the exacting duties that their calling demands of them. So that at the last meeting President McKinney appointed a committee to arrange for such a function; and we are advised by Chairman MacKellar that it is to be held on Wednesday, February 19, in the "Beef Steak Garret," Reissenweber's, Fifty-eighth street and Eighth avenue. Excellent talent has been secured, and a good time is assured. Tickets may be procured from Drs. R. W. MacKellar, 351 West Eleventh street; Maffit Smith, 43 West Ninetieth street, or C. Rhorer, 128 West Fifty-third street.

CORRESPONDENCE.

NERVOUS AND INTESTINAL ATONY IN CATTLE FROM UNCERTAIN CAUSE.

WORMS IN PROTEID—HYPERSENSITIZING?

Editor AMERICAN VETERINARY REVIEW, New York:

I would be very much pleased for your opinion of a disease among cattle I've had in 1911 and 1912, latter part of August and September, about the same time both years.

History. 1911—One farmer, pasture low land with several swamps and timber; one crude oil well and one gas well in pasture, not operated; lost three cows and one bull. Called in Assistant State Veterinarian and B. A. I. employee; concluded to call it malaria from stagnant water, although were watered night and morning from well, but had access to the stagnant water. Food all examined and apparently best. Flies and mosquitoes worst I ever saw.

1912—Same farmer lost two or three and treated three or four others successfully. Same condition as 1911, only flies and mosquitoes worse. One neighbor lost two, same symptoms, not treated; also low land. Another farmer, high lands, hilly pasture, running spring water, lost six so far; last two treated unsuccessfully. Looked carefully for ticks several times; none found. This farmer on hills bought several head from neighbors also on high lands but none from stock yards.

Symptoms—Pulse 90-130; temperature, 100-101½° F.; peristalsis ceases; no intestinal nor gastric fermentation; anorexia sets in only from 24 to 48 hours before death. Examining the herd in pasture, would find the pulse to be the first symptom, some apparently well with pulse 90. Marked anæmia of all visible mucous membranes, as in a fatal case of hemorrhage, becoming paler as case progresses. After pulse reaches 100 and anorexia present, they die in from 6 to 24 hours. About two-

NOTE—The REVIEW editor being confirmed in his opinion by one of the collaborators engaged in cattle practice, that the symptoms described in the above query were out of the ordinary, submitted it to one of the profession's highest authorities, whose answer, following Dr. Michael's inquiry, will be found most interesting and instructive reading, and furnish an abundance of food for thought.

thirds treated while still eating and pulse not over 85 would recover, with full doses of quinine, digitalis, nux, and Spts. Frumenti.

Post-Mortem Lesions—Subcutaneous and visceral regions in an anæmic condition; lungs normal; liver slightly more yellow than normal, and little softer; gall bladder enlarged, filled with very thick, flaky gall; spleen soft and pulp darker in color; ingesta normal except in abomasum a little dryer than normal; kidneys normal; bladder and urine always normal. *Circulation*: Heart muscle blanched; patches of ecchymosis on pericardium; left ventricle and auricle filled with large, tough, reddish clot extending into blood vessels for about 18 inches; right ventricle and auricle filled with dark, tough clot. At ends of clots an amber jelly-like mass not so tough; these clots cut about like normal liver. Bones normal, brain and meninges bleached. Post mortem held about six hours after death. Might it be some protozoa inoculated by flies or mosquitoes?

Yours very truly,

Dr. L. B. MICHAEL, Collinsville, Ill.

REMARKS BY PROFESSOR LAW.

In a second letter from Dr. Michael he gives the following additional points:

The oil and gas wells were on one farm only; the disease occurred on three farms.

A large *lead smelter works* is operated 3 to 6 miles from the farms, and near this, several horses and cows have died from the arsenical fumes.

The farmers haul no manure from the city, therefore this source of lead may be excluded.

Cattle are the only animals affected. Dr. M. does not believe they go near the wells. Sex and condition seem to make a difference.

As cool weather set in the disease disappeared. Emaciation is not evident. Pulse rapid, 90+ from the first. Breathing is only accelerated in the very last stage. There is no uneasiness, pain, nor anorexia at first.

Necropsy shows very extensive blood clots. Dr. M. estimates from this that one-fifth of the peripheral blood supply had been used up in this way before death.

There was no microscopical examination made of anything.

There was a complete absence of peristalsis, yet the abdomen

felt normal on palpation. One farmer gave 6 pounds *Sodii sulphas* to a patient with no result. To two cases in the advanced stage Dr. M. gave physostigma-pilocarpin compound without effect. Both died about two hours after.

It may be well to here deal shortly with different supposed causative factors:

1st. *Arsenical Poisoning*—This in certain chronic forms has been found to be associated with fatty degeneration and muscular atony or even paralysis. But beside the distance from the lead smelter (3 miles and upward), arsenic is discredited by the following considerations: (a) The Collinsville disease is confined to cattle, whereas the arsenical precipitate would have affected other herbivora on the same pastures and especially on such as were closer to the smelter; the Collinsville disease is confined to a month of the hot season instead of continuing through the year, or the season of pasturing, as with an arsenical precipitate; the Illinois disease rapidly develops to a fatal acuteness following its first manifestation, whereas the arsenic from the smelter would have rather caused a slowly advancing affection as the poison accumulated; in the two successive years (1911 and 1912) the malady has been shown in the hot autumn months only, and in 1912 after the heavy rains of August, when the poison should have been largely washed off from the vegetation; finally, the symptoms don't agree with those of acute arsenical poisoning which usually eventuate in mucous gastro-enteritis and diarrhoea as stated by Dr. M.

Lead Poisoning—This is more probable than the last, as plumbism causes spasms and even paralysis not only of *voluntary muscles* but even of the *involuntary muscles* of the bowels, womb, etc., and is habitually productive of obstinate constipation as in the Collinsville affection. The same objections may be made to lead poisoning as to arsenical poison from the smelter. Dr. M. is positive that no city manure has been put on the lands, so that we must apparently discard the idea of paint, paint-pot scrapings, sheet lead, oil cloth, leaded papers, etc., which might be admitted through such a channel. There remains the lead and cotton waste packings from the oil and gas wells, though these have not been operated for some time. The paint used in such joint packings is not altered by time nor exposure, and it is no uncommon thing to find that it has been turned under by the plow one year and plowed up and left on the surface one, two or three years later, so that the cattle chew and swallow it to their own undoing. Cattle, especially cows, have a special penchant for chewing non-

alimentary matters, so that apart from the sweetness of certain lead compounds (acetate), they are exposed to plumbism above other domestic animals. Dr. M. does not think the cattle went to the wells, but evidently the way was open for them to go if they chose, and it would be rather surprising if they never did. The probability that the lead was the toxic factor is, however, much diminished by the fact that the disorder occurred in two successive years on three farms, whereas the suspected wells were only on one of them. If the fences were good, this seriously discredits the wells as a source of the poison. There is the further drawback that, when lead poisoning proves so rapidly fatal as in the cases before us, there are usually such marked symptoms of nervous disorder (dullness, stupor, clonic spasms, bellowing, delirious dashing about, pushing against a wall or other obstacle) as can hardly be overlooked. But it is such a common experience that the lead has been introduced in an unsuspected way that, in any future cases, a careful examination should be made of the contents of the stomachs and analysis of these, the liver and spleen, so as to exclude this possibility and narrow the inquiry down to other channels.

Narcotics—Among narcotic plants we have a long list, indigenous or acclimatized, which should be looked for in the pastures where animals suffer. I may name crowfoot, milkweed, sneezeweed, aconite, veratrum, larkspur, poppy, belladonna, hyoscyamus, thornapple, lobelia, conium maculatum, cicuta virosa, potato tops, sunned (green) potatoes, lily of the valley, yew, poison ivy, poison sumac, spurge and narrow-leaved laurel, etc. Poisonous ryegrass or darnel is always injurious, but many of the grasses and legumes are likely to be dangerous only when ripening. Thus ripening ryegrass has long been associated with staggers in horses and cattle in Europe; the same is shown to a lessened degree in the different small grains, millets, and notoriously so in vetches, lupins, peas and various trefoils.

Forage Poisoning; Cryptogamic Poisoning—This brings us to the question of analogy with the *Kansas equine enzootic* of the past year (1912). It is true that horses only suffered in Kansas, and cattle only in Illinois, but the two outbreaks agree perfectly as to date of appearance and time of prevalence, in that they both followed a wet spell, prevailed during the hot weather, and subsided abruptly on the onset of cold. Both involved the nervous system and showed a remarkable intestinal atony, and both are said to have been attended by extensive ante-mortem blood clots and consequent embolism. Horses suffered more

from cerebral disorder, while cattle had early circulatory excitement and rapidly advancing anæmia. *Forage poisoning* appears to have been extensively prevalent in adjoining states as Iowa (Dimock) and Nebraska for years past. It is a convenient name under which may be included a number of different forms of poisoning due to various diverse factors. Even if we change the name to *Cryptogamic poisoning*, it helps little in this respect, as the cryptogams growing on or in forage are multifarious, and the identification of each, with its resultant symptoms, remains an important desideratum. Besides, it is a common experience that the pathogenesis of a cryptogam often varies according to its stage of growth, to the environment in which it has been grown, to the abundance or paucity of light and air supplied, and to the food, etc., of the victim. It follows that it may vary according to the genus or species of animal upon which it operates, and to the constitution, condition, food, etc., of such animal. The complexity of the subject, the imperfection of the knowledge as yet in our hands, and the discrepancies in the records of observations on particular cryptogams, make the field an uninviting one; yet it is well to know that two reports on the action of the same cryptogam, which seem to be mutually contradictory, are not to be taken as indicating that the pathogenesis described in the one is to be absolutely rejected. It may mean only that the conditions have been different in the two, and that in identical conditions the results would have been the same. The difference in results may indeed be of the highest value to the careful investigator as opening up new truths through a study of the varying conditions. In this, too, we find an explanation of the notorious fact that a spreading disease carrying a rapidly advancing destruction like the *Kansas equine affection* will promptly undergo arrest and rapidly disappear without obvious cause.

The recent Kansas outbreak reminds me forcibly of an experience which I had in the Sunflower State in the early '80's. The whole country was suddenly startled by the report of an outbreak of *foot-and-mouth disease* in southeastern Kansas. I was at that time chairman of the U. S. Treasury Cattle Commission, but was well satisfied by the published reports that the trouble was the old and well-known *gangrenous ergotism*. I did not feel justified in spending government money in personally visiting the afflicted state to investigate a delusion that must very soon collapse like the bubble it was, and show its own insubstantiality. But the delusion spread rapidly and gained impetus as it extended. The state veterinarian and a veterinary commissioner

from Canada agreed that the malady was the genuine *foot-and-mouth disease*. The Governor quarantined the affected herds, other states were preparing to lay an embargo on all Kansas ruminants, Kansas live-stock industry was threatened with temporary ruin, the enormous domestic trade of the country bade fair to be seriously injured, and the next step could not fail to be the exclusion of American live stock by outside nations. I felt now that the mistake was becoming a national calamity and that I could no longer resist the renewed and increasingly urgent request of Judge French, Assistant Secretary of the Treasury, that I should go west to the seat of trouble at once. I accordingly went and found, as I expected, a very imposing exhibition of *gangrenous* destruction of distal parts. Whole herds were affected so that infection had been a plausible explanation and too easily and universally accepted. Some had necrotic sores around the coronets which had been sunk in the black mud of the spring thaws; others had the hoofs separated and either shed or semi-detached from the *quick* which showed the beginnings of the necrotic processes; others were sloughing, or had already sloughed off the digits at the fetlock, or the limb through the lower or upper metatarsal region; others were shedding the withered tips of the ears or tail; others had small necrotic sores on the lips or buccal mucosa. But at no point were there the large vesicles, covered by cuticle and with serous contents, as in *foot-and-mouth disease*, and in no case did sheep or swine suffer though kept in the same muddy yards with the stricken cattle. Horses, when affected at all, showed only the small necrotic sores on the buccal mucosa. There was no room for doubt that the public scare was the result of an error, but the error had got the start of the truth, it had already secured the ear of authority, of the general public, and of an antagonistic trade competition. Truth was placed in a woeful minority and the errorists were very confident in their position. It was evident that a demonstration was necessary to carry conviction not only to the general public, but even to the veterinarians who had fallen into the mistake. I therefore inoculated sheep, swine and new-born (sucking) calves, and, after two days' interval, obtained no trace of infection or inflammation at the points of inoculation. The demonstration having been successfully accomplished, report was made to the Governor, the quarantine raised, and, with attention to the needful instructions as to food, the "*foot-and-mouth disease*" in Kansas was definitely ended. In the genuine foot-and-mouth disease invasion in 1908, mistakes of the same kind were common

and inevitable. In New York, in counties far outside the real area of infection, cases of *mycotic stomatitis* were reported as the infectious disease which, if accepted, would have subjected a great part of the state to quarantine and the live-stock industry to very heavy losses. In Delaware County, Pa., I stood beside the open trench dug to receive the carcasses of a considerable herd, which had been condemned as suffering from the pestilential disease because they bore on their mouths these spots of mycotic gangrene. In this case the condemned animals had come from Baltimore, West Virginia and Ohio, and if the error had not been corrected, and the stock saved from destruction, the contemplated act would have logically entailed the quarantine of the States of Maryland, West Virginia and Pennsylvania at least, and untold losses upon the American live-stock industry.

Cryptogamic Poisoning is the result of different non-flowering plants in different cases, and as such plants are often toxic, they are common objects of suspicion. Many, however, like the common field mushroom and its edible allies, are, when fresh, justly esteemed as food. Our common yeast is almost indispensable to our modern civilization. Yet even this produces its narcotic alcohol and irrespirable carbon dioxide. The *monasces purpurens*, growing in silage exposed to air, has proved fatal to horses (Buchanan). Blue mould has been the supposed cause, on many occasions, of mycotic stomatitis and intense cerebro-spinal disorder. Bitting found it especially lethal when complicated with fusarium. The other moulds at the period of their full strength, fed in spoiled grain, are credited with the loss of hundreds of thousands of dollars yearly. Ergot has been already referred to. Smuts under given conditions are similarly incriminated. Space would forbid a fuller list of these. Though not always equally poisonous, the specimens named and others of the same family groups are always to be dreaded when conditions favor toxic action and receptivity.

Bacteria Poisoning—Bacterial ferments and their products in grain and fodders are chargeable with similar troubles as those just laid to the charge of cryptogamic invasion. They have the same uncertainty in successive cases, often reaching a great potency, with a high mortality which may be maintained for a time and then suddenly disappear. The pathogenicity may also be dependent on the nature of the food furnished in the seed invaded, on the variation in the supply of air or sunshine, on the state of the weather, wet or dry, on electric disturbance, on the presence of other bacteria and their products, and on the suscep-

tibility of the animal exposed. It will be most interesting to notice the coccus which has been advanced as the cause of cerebro-spinal meningitis or the Borna disease in Europe.

Coccus, Diplococcus or Streptococcus of Borna Disease—This has been found in many outbreaks in Europe and America in the subarachnoid fluid of affected animals. It may be found as a gram positive *monococcus*, 0.6 m. in diameter and less frequently as a *diplococcus* (Siedamgrotzky), or, again, as a *streptococcus* with 6 to 9 cocci in the chain (Ostertag). It grows readily on a gelatine plate, forming a sharply circumscribed colony, the size of a linseed, raised in the centre, and of a dirty grayish white; also in bouillon producing turbidity with a flocculent appearance beneath. Cocci have been found in the blood as well (Johne) and in other domestic animals showing similar symptoms. It has been largely accepted as the essential factor in the disease and attempts at immunization by sera have been resorted to. The apparent temporary success of such a measure can mean no more than does the habitual, sudden subsidence and disappearance of the malady in the entire absence of such a resort. This characteristic feature of the disease is far better in harmony with the introduction of a poison from outside than with the modification of a bacteridian poison in the body. If the observer comes to the question with a preconceived opinion in favor of bacteridian infection as the essential cause, he finds much to accord with the idea. But is the mere presence of a germ absolutely conclusive? Does similarity of the germ in two different outbreaks prove the identity of the two germs? Does a wider acquaintance with the disease sustain or lessen confidence in the constant and essential potency of this germ factor? In answer we may quote, 1st, the difference in physical or evolutionary structure of the germ found in different outbreaks—a *monococcus* (Siedamgrotzky, Schlegel), *diplococcus* (Johne, Marcq, Wilson, Brimhall, Christian, Weichselbaum, Ostertag), *micrococcus* (Wilson, Brimhall), *streptococcus* (Ostertag, Streit, Grimm). If it is claimed that all are spherical and that the distinction depends on the promptitude of separation of the individual cocci (before or after the formation of the chain), it must still be conceded that this difference of form constitutes a clear distinction, and it is for the advocate of identity to show why in the same temperature and environment (circulating blood, cerebro-spinal fluid) there should be these different forms in different outbreaks. It is not due to a difference in genus of the victim, is it then to a difference in the blood and spinal fluid from food, water, concurrent disease,

peculiar individual metabolism, special quality or amount of secretions, or to the presence of another germ (as when *Bacillus acidi lactici* enhances the potency of *Bacillus anthracis*). 2d, There is a wide difference as to the certainty of the asserted propagation of the disease by giving or inoculating the alleged germ in successive outbreaks. It has been assumed that infection is introduced casually in food or water, but this is but an inference, there is no experimental demonstration of such a result. Hutyra says the disease is not transmitted directly from animal to animal. As regards susceptibility, he places the horse first, followed by the sheep and at a greater distance by the ox, while swine and dogs prove resistant. Susceptible animals are not readily infected when the germ is administered by the mouth, nose, alimentary canal, subcutem or even intravenously, but much more frequently when injected under the dura mater. In the last-named method there is the risk of mechanical injury or complex infection. 3d, Hutyra further assures us that an animal recovered from an attack has no immunity against a future invasion. This agrees much more perfectly with a simple poisoning (cryptogamic or chemical) than with a bacteridian infection. If established, it would put artificial immunization out of court, for, however the animal system becomes habituated to and tolerant of poisons, this tolerance does not rise to the degree of obviating entirely the toxic action of an excessive dose. It certainly forbids us to accept the theory that the sudden cessation of new cases is due to a tolerance induced by a first attack. It turns the observer back to seek, in cryptogamic or other poison, the explanation of the sudden destructive outbreak, and its equally sudden ending. 4th, If the theory of bacterial infection must be accepted, its advocate must explain the absence of the disease through the great heats of summer and until the end of July or August, and no less its disappearance in September, before the really cold weather has set in, in the latitude of Kansas or southern Illinois. 5th, If he should appeal to rain as well as cold, he must show how a microbe, living and multiplying in the animal body with a blood temperature of 99° to 102° F. constant all the year, is to be affected by outside conditions. In Germany cases are reported in January and February, rising to large numbers in May and June and gradually decreasing through the third quarter of the year. This is on a latitude much higher than that of Kansas, Missouri, Iowa or Illinois. 6th, Flies and other predatory insects may be invoked as carriers of the germ, but these do not delay their yearly advent until August and do not cease their attacks in September.

Protozoa—Dr. M. questions whether a protozoon carried by insects may not explain the Collinsville disease? Located as this place is on a line of rail, a short distance east of St. Louis, it would not be surprising if the fever tick bearing the *Piroplasma biguninum* should have been dropped in the pastures. The disease occurred at the right season, produced the requisite anæmia in the victim, was sufficiently fatal, and subsided after a heavy rainstorm which habitually interrupts the activity of the tick and might seal its fate and arrest the disease if followed by cold. But there was an absence of ticks on the cattle; there is no evidence of engorged spleen nor enlarged liver; the high temperature of Texas fever is wanting; the remarkable intestinal atony and constipation are not characteristic of Texas fever, nor is the coagulation of the blood before death. Another *protozoan* disease of cattle known to exist in this country is the *chronic Texas fever associated with the round Anaplasma marginale* in the blood, but the absence of Southern cattle and of the ticks virtually decide against this, even if the Collinsville disease had been more chronic and less fatal. The *Trypanosoma Americana* is common in American cattle, but so far no visible illness nor fatality has been found to attend its presence. Next to these should be named *Coccidiosis*, but severe cases of this are usually seated in the bowels and give rise to a *red diarrhoea*, exactly the opposite of the condition in the Collinsville disease. Cattle have been so often exposed to the *malarial* parasites affecting man without any evil result that we may dismiss the question of this at once.

Blood-Sucking Worms—Dr. Rogers, of Manhattan, is strongly of the opinion that the *Kansas horse disease* is the result of the wandering larvæ of the *Strongylus armatus* (*Sclerostoma equinum*) and the resulting clots and embolisms of the arteries. The worms have been found in the blood and coagula in the arteries of the brain and lungs as well as of the abdomen. But he fails to note that these larval worms are found everywhere where the mature worms abound, yet a long experience with such verminous epizootics of the most severe and destructive types has failed to show elsewhere outbreaks with the symptoms and lesions of the Kansas disease. One swallow does not make a summer, and one or ten cases of arterial brain embolism, even if larvæ are found in some of the clots, will not prove that 20,000 or 30,000 horses died within two months from the wanderings of these larvæ into the brain and lungs. We have seen high-class breeding studs affected with severe strongliasis, where emaciation, anæmia, stunted growth, cachexia, rachitis, marasmus, and even

verminous colics were common, but they developed no such continuous line of cases showing the nervous and pulmonary attacks of the Kansas victims. In a pure parasitism of this kind, is it conceivable that all cases in Kansas should take on this form, while everywhere else they take on other symptoms? Something in addition to the parasites must be found in the Kansas cases to explain the interesting anomaly. Whatever this superadded pathogenic factor in the Kansas outbreak may turn out to be, we may rest assured that such a factor was present. The symptoms and lesions recorded have from the first suggested one or other of the cryptogamic poisons, and it would not be surprising if this should be the final verdict.

Proteid Poisoning—Dr. Rogers' arraignment of the strongles, however, suggests to us another probable explanation in which the blood-sucking and migrating worms may bear a prominent pathogenic part. Modern medicine has made us familiar with *anaphylaxis*. It may be shortly stated that this implies a poisoning by a proteid foreign to the animal exposed, but a dose of which has been taken a certain number of days before and has aroused an extreme sensitiveness to a second dose of the same agent. Such alien proteids introduced through the healthy stomach or other intact mucous membrane undergo a form of digestion that makes them safe and wholesome; to hypersensitize the system to a second dose, the proteid must have been injected unchanged into the tissue or circulation (lymphatic or hæmatic), and thus have escaped the protective action of the cells of the mucosa. Here, then, is where it seems possible for the worms to prove a baneful or deadly factor. In sucking the blood, each of the myriads of worms plunges its circle of buccal lancets through into the capillary vessels, and when it has finished its meal it leaves a row of many fine bleeding points. Multiply these many hundreds or thousands of times and we have ample entrance channels for the solution of dangerous proteid. Add to this the many holes through which the larval worms have penetrated the mucosa to find a home for their development in the submucous cysts, the serous cavities and the blood vessels. Not only does each larval worm make an entrance channel for the inimical proteid, but it may further carry the proteid with it on and above all in its body. The proteids may be from different sources, they may be from the fodder, from injurious plants mixed with the fodder, from cryptogams and ferments (bacterial and otherwise), parasites of the food, or of other vegetable or even animal origin.

Nothing can be more deadly than such proteids when enabled

to operate anaphylactically. The bland white of egg is one of the most potent. The proteids of hempseed, flaxseed, castor bean, Brazil nut, cocoanut, pea, vetch, wheat, barley and maize, respectively, each produce a most deadly hypersensitiveness to a second dose like itself.

It need not be added that this has not been proven to be the true explanation of either of the diseases dealt with above. But as we have been dealing with theories, which are confessedly as yet but speculations, it cannot be out of place to advance one speculation more, which may form the basis for future investigation. The new speculation has at least the merit of a sound scientific basis in a known truth. It has the additional recommendation that should it be borne out by observation and experiment, it would explain the delay of the outbreak until the incriminated proteids had reached the stage of growth and metabolism at which they could operate as deadly anaphylactics, and no less the sudden suppression of the malady when the same metabolic products had passed beyond the stage when they could operate with deadly effect. Just as the seeds of certain gramineæ in maturing reach a stage at which they cannot be safely fed, yet later become again perfectly wholesome, so the sensitizing poisons may be most deadly at a given stage, and become later comparatively harmless when that stage has been safely passed.

Once proven the application of this to the Collinsville cattle disease is obvious. The different symptoms and lesions may be explainable on the basis of distinct forms of proteids introduced. Then the entrance channels for these may be formed by different blood-sucking or migrating worms—the hook-worm, *uncinaria radiatus*, *strongylus radiatus* or *filicollis*, *cooperia curticei*, *pectinata*, *punctuata* and *onchophora*, the whip-worm, cattle filaria, *cysticercus bovis* and *tennicollis*, *esophagostoma*, and, though outside the worm family, the embryo gad-fly and the bilharzia. Apart from the worms, infection atriæ may be found in tuberculous ulcers of the mucosa, *vomicæ*, invasion by acid-fast bacilli or by coccidia with attendant abrasions, and all kinds of wounds by sharp-pointed bodies in the food. The mind should be open to the great variety of dangerous proteids, and no less to the fact that in case of recovery from an anaphylactic shock an immunization has been established against that particular proteid by the formation of its anti-bodies.

JAMES LAW, Ithaca, N. Y.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

KANSAS CITY, Mo., January 14, 1913.

Editor of the AMERICAN VETERINARY REVIEW, New York:

In an open letter in the January, 1913, number of the AMERICAN VETERINARY REVIEW, page 464, over the signature of one R. A. Archibald, and reinforced with the apparent authority and responsibility of a very important office, namely, "Chairman Committee on American Veterinary Medical Association Affairs," the readers of the REVIEW are invited to join with the author of the letter in a discussion of the affairs of the A. V. M. A., using the pages of the REVIEW as a forum. To those who have little or no knowledge of the association's affairs, the numerous affirmations and innuendoes contained in the letter will naturally be construed to mean that the A. V. M. A. is not devoting its efforts to the purposes set forth in the portion of the constitution quoted, and that the author of the letter is such a loyal and faithful member that he will not listen to proposals of secession (it is regrettable that the names of the proposers of secession were omitted from the letter), but has set himself to the task of leading the association out of the clutches of a designing few (not more than four) who have been using this organization for selfish purposes. This organization of over 1,500 hundred veterinarians is composed of sturdy practitioners, state board examiners, state veterinarians, federal officers, executive heads of departments of public service, college professors, editors, etc. Oh! The monstrous four! The predatory coterie! The despicable and mendacious grafters! The call is for volunteers to help unhorse this mighty few.

Those who are really acquainted with the affairs of the American Veterinary Medical Association are astonished at the rapidity of its growth in members, and are proud of its achievements along the various lines of its several activities. Only the chairman of the aforesaid committee is blind to the splendid and general goodfellowship manifest at every annual meeting. Brotherhood and true fraternity permeates and dominates all the association's doings. The members from British Columbia, Manitoba, or Quebec are as cordially greeted and as heartily applauded as the member from California, New York or Illinois. The association certainly exemplifies international goodfellowship. The fulfilment of the other announced purposes of the association are as patent to the unbiased observer as the one just discussed.

True, the ideals have not been reached and we trust will ever lead the membership to greater achievements, and if the aforesaid Chairman and one or two others, well known to the membership, will put aside their active political aspirations and devote their energies to the promotion of Article II. of the Constitution quoted in this aforesaid letter, their good works will be duly rewarded. When they learn that office in scientific bodies should seek the man, rather than the man seek the office, they will get themselves into harmony with true fraternalism, true fellowship among members of the profession.

If the young blood alluded to in the CHAIRMAN'S article is made up of those who are applicants for membership, that they may become "self-respecting aspirants for political honors," regardless of their compliance with the accepted code of professional ethics, there can be no doubt that the Association will better fulfil the purpose for which it was created without their inclusion in the membership.

The plaint of the CHAIRMAN is born of failure to control Association affairs by political tactics, undertaken in utter disregard of the distracting and blighting effects experienced by the Association through such tactics heretofore, and which methods the Association put aside in 1905, by adopting the present methods of nomination to fill offices. The Association will put the present method aside as soon as a still better method is found.

The harsh and uncomplimentary language used in this letter concerning the presiding officer was made without taking into account his, the CHAIRMAN'S, somewhat recent violations of the Association's code of ethics and consequent blasting of his immediate opportunity for high office. The old saying about glass houses and throwing stones is applicable. Let the good brother get right and keep right, and we will jointly help make the A. V. M. A. grow more rapidly toward the ideal.

(Signed) H. JENSEN.

THE INSULAR VETERINARY SERVICE.

BLACKSBURG, VA., January 6, 1913.

To the Editor of the AMERICAN VETERINARY REVIEW:

I was much interested in the criticisms by Dr. Ward in the December REVIEW of the report that I made as chairman of the Committee on Insular Veterinary Service to the A. V. M. A. annual meeting in 1911, and his glowing account of the splendid

opportunities, financial and otherwise, that the Bureau of Insular Affairs now offers to veterinarians in the Philippines. I regret that the published report of the A. V. M. A. for 1911 omitted my verbal remarks made preliminary to the report I presented, as I stated that the report presented was mine alone, and I only was responsible.

My friend Dr. Ward is correct when he assumes that the report was made at "the eleventh hour and without all available information." I had waited a year for the valuable information that Dr. Ward possessed, and not receiving anything from him until it was too late to get a letter to the Philippines and a reply, I made the report referred to, a report that I still maintain was substantially correct at that time.

In the summer of 1909 on my return from five years' service in Cuba, I went to Washington at the request of the Bureau of Insular Affairs to consider with them the acceptance of the position which Dr. Ward now so ably fills. I declined to consider the place for two of the reasons given in my report, insufficient pay and unsatisfactory political conditions that existed among the American civil officials in the Philippines. I got my information from the published reports and from the members of the Bureau of Insular Affairs and other civil employees who had seen service in the Philippines and in whose conservative judgment I had confidence. Later when I was visited by one of the high civil officers of the Philippines he fully confirmed the absolutely unbiased opinion that I had previously formed. I rejoice with Dr. Ward that this serious hindrance to veterinary progress there has been eliminated, although one of the officials who was said to be a stumbling block is still in the service there. Dr. Ward has undoubtedly converted him from the error of his ways.

The question of adequate remuneration is one of opinion, and, taking the figures given by Dr. Ward, I still hold that for foreign tropical service the pay is not adequate. At the time I mention it was very difficult to get veterinarians even without special qualifications for that service to enter. They are undoubtedly swamped with able men now. As to promotion, Dr. Ward states that there are 28 positions with five vacancies in two years. Surely the vacancies did not occur from death in such a health resort as the doctor pictures the Philippines, so we must assume that they retired to live on the wealth they had saved from the salaries he mentions.

It was unfortunate that I used the quotation "grim destroyer fever." It was one of the unfortunate errors that my awkward

pen is frequently committing. I assumed that it would be understood as a figure of speech. There is one statement in Dr. Ward's criticism of my report that is correct and to which I agree and that is that my report was "altruistic." There was not the slightest idea of personal gain in making the report. It was made solely in the hopes that it might be of benefit to others.

The report that Dr. Ward attempts to criticise was really a plea for a properly organized army veterinary service. As our insular possessions, Porto Rico, Canal Zone, Hawaii and the Philippines, are administered by a bureau of the War Department, I believe that the veterinary work could be better and more logically administered by a properly organized army veterinary department than it now is in the haphazard way. I cannot say plan, for there is none at present in force.

I am fond of the tropics and have visited many different countries and lived in the tropics longer than has Dr. Ward, and probably under as favorable living conditions. I know how expensive life is there and how great is the isolation. The risk from febrile and intestinal diseases is greater there than in the temperate zone in spite of Dr. Ward's statistics, and there is no retired pay in case of disability. I hope that nothing I have written will be interpreted as reflecting in any way on the excellent work that I believe my friend Dr. Ward is doing in the Philippines. We need many such men in our insular service and I hope that the ideal conditions pictured by Dr. Ward will attract many to this service that in the past has been begging for qualified men. With such conditions as now appear to exist we shall expect splendid results from the Philippines.

N. S. MAYO.

COTTONWOOD, MINN., January 6, 1913.

Editor, AMERICAN VETERINARY REVIEW, New York:

This comes from a constant and careful reader of the REVIEW. A magazine such as yours, that brings to us the cure and treatment of ailments from European and American scientists and veterinarians, is certainly a great help to the practitioner, whether he be engaged in the business for a long or a short time. For we never are too old to learn and a beginner may be initiated with great advantage, especially so when the information comes from a reliable source. A back-number veterinarian will never dare to make a statement or a suggestion.

Now I have in mind to have a short chat with Dr. Horace Bradley. I agree with him that we are taught many ways to cure a disease or an ailment in a text-book, but when carried from the dead leaf into practice, that treatment sometimes fails. Do we not have Dr. S. H. Ward's statement in January issue that "there are points met with in our autopsies which differ materially from those given by these authors (Hutyra and Marek)? Further on under "Autopsy," on page 440, Dr. Ward says, "the condition of the spleen in *cases* (not one) coming under our notice is at marked variance with the findings of Hutyra and Marek, who state 'the spleen preserves a normal appearance.'"

Of course there is no thought to dispute the reliable writings of these authors. But the way I always figure it in my mind in all cases, whether veterinary medicine or otherwise, is "have the other fellow's advice as a *passive* and use your own judgment as an *active* means." In other words, to use the common parlance, "use your horse common sense."

After all this preface my chat with the doctor commences.

Dr. Bradley, I like your way of treating choke in animals. I like it just because it requires not much work and is very simple. I had an opportunity in the June issue of this paper to write of treating azoturia with KNO₃. This KNO₃ treatment applies also for laminitis. I have used this treatment frequently and it has seldom failed.

Now for choking. Apomorphine has been used with great advantage, and subcutaneously, as it is more quickly absorbed that way. Its action is expectorant and sedative, and produces relaxation and increase of secretion.

If I understand the doctor right, in a case of choking all we need is relaxation and increase of secretion. Won't hot, *very* hot compresses of H₂O on the oesophagus render the same service? I do not mean to discard the apomorphine treatment, as in all probability the next time I am called to a case of choke I may use it. But I have used more than once the hot water treatment, and a gentle downward manipulation with the fingers on the gullet, and never failed. If Dr. Bradley labels his treatment No. I. I shall label mine No. II. A few cases in which No. II. treatment was used with great advantage:

Case 1.—A bay mare, a family horse and a pet to the children, swallowed a corn cob that was lodged in the middle of the cervical portion of the oesophagus. The mare would shake her head in all directions in a spasmodic way, some glairy liquid ran from the nostrils, the cervical muscles would contract so as to

clearly show the direction of the fibres. The jugular furrow was obliterated. The fluid would occasionally flow down and I was summoned in a great hurry. Being desirous of locating the cob, I requested the owner to hold the halter and I laid my right arm around the neck and with my left hand got hold of both nostrils and interfered with respiration for about half a minute. Did this three or four times. Water by that time was gotten and the mare was greatly relieved after ten minutes' application, and the children were singing "Hosanna" when they saw their dear pet drinking water and eating.

Case 2.—A gelding choked. Hot water and extension of neck as much as possible, so as to enable one to push down the foreign body, brought prompt relief.

These two cases are a few months old. The horses are doing their daily duties as if never anything had happened to them, but I treated a case about two weeks ago and I do not know the outcome as yet, as the farmer lives many miles from me and has no 'phone. I was afraid some oats had entered the trachea in that case.

Respectfully,

S. J. ALCALAY, D.V.M.

MICHIGAN VETERINARIAN BANQUETED BY HIS COLLEAGUES.

—Dr. Cummings, of Port Huron, Mich., was tendered a banquet by his professional friends in Michigan at the Hotel Richter, in Detroit, on January 7. He was induced to go to Detroit on a pretext by his friends and was thoroughly surprised and delighted. He was presented with a beautiful leather chair as a testimonial of the esteem in which he is held by members of the state association. Dr. Brodie, of Pontiac, presided, and impromptu toasts were responded to by nearly every man present. Dr. Cummings has practised veterinary medicine in Michigan since 1870. The following were present at the banquet: Drs. Brenton, Hawkins, Joy, Veldheuis, Krey and Morrison of Detroit; Drs. Dunphy and Wilson of Rochester, Mich.; Dr. Wilkinson, of Holly; Dr. Brodie, of Pontiac; Dr. Gibson, of Adrian; Dr. Baldock, of Birmingham; Dr. Cavell, of Northville; Dr. J. B. Stevens, of Yale; Dr. M. J. Smead, of Port Huron; Dr. Black, of Richmond.

OBITUARY.

WILLIAM DOUGHERTY, V.S., D.V.S.

Dr. William Dougherty died suddenly at his home in Baltimore, Md., on the morning of January 2, 1913, in the 69 year of his age, having been sick but five days. The cause of death was fatty degeneration of the heart. Dr. Dougherty was born in Gortin, Tyrone County, Ireland, in 1844, and came to America when quite young, and entered the U. S. Army as Director of Transportation in the Quartermaster's Department, located in New Orleans. On leaving the service he went to Lakewood, N. J., where he was successfully engaged in the stable business until 1870, and afterward trained race horses until he finally entered the New York College of Veterinary Surgeons, from which he graduated in 1874, receiving the degree of V.S., and two years later graduated from the American Veterinary College, receiving the degree of D.V.S., at which time, 1876, he went to Baltimore and began practice, continuing the same up to a few years before his death, when he retired. During his years of retirement he traveled considerably; had made several trips to Europe, always spending some pleasant days in Paris with his tutor and life-time friend Professor Liautard. Dr. Dougherty was one of the loyal veterinarians that always put his profession first, and by his life and business methods did much to uplift it. Being an old and faithful member of the A. V. M. A., he was well known to veterinarians everywhere. He was a charter member of the Maryland Veterinary Medical Association, and during his membership occupied the several offices in the organization. Dr. Dougherty was a widower at the time of his death, having lost his wife (who was before her marriage Miss Matilda Sproul, of Philadelphia) in 1899. The doctor is survived by a nephew and niece, who reside in Massachusetts. His genial presence will be missed by his host of friends at the A. V. M. A. meetings, as well as by his fellow veterinarians in Maryland. At a meeting of the Maryland Veterinary Medical Association on January 14 a committee was appointed to draft resolutions of regret on the death of Dr. Dougherty. Some of his close friends in the profession acted as pall bearers at his funeral. Among whom were Drs. H. A. Meisner, Joseph P. Grogan, Frederick L.

Filber, C. L. Mackie, H. F. Mackie, Daniel R. Hoffman, Joseph M. Heagerty and Horace A. Hedrick.

FIELDEN LETT, JR., M.D.C.

Dr. Fielden Lett, Jr., died at his home in Seymour, Indiana, from the result of an injury to the spine received more than four years ago in falling from a hay-mow; which, despite the best medical care, rendered him powerless below the waist at the time, and he remained so up to the time of his death. Dr. Lett was married to Miss Pearl Hudson, in 1900, while a student at the Chicago Veterinary College. On graduating from that institution, in 1902, he began the practice of his profession at Seymour, Indiana, and enjoyed a lucrative practice up to the time of his injury in August, 1908; the four long years since which time, until he was called to his Maker, have found his faithful wife always at his side, never faltering in her unfailing love and care for him. His jolly disposition that made him many friends in his college days remained with him during the long period of helplessness, and a smile and a handshake was ever ready for a calling friend. Up to the time of his injury he was an active member of the Indiana Veterinary Medical Association, and was a faithful attendant at its meetings. He is survived by his parents and two sisters, as well as the widow, to whom the sympathy of the veterinarians of Indiana and his class-mates of the Chicago Veterinary College, 1902, are extended.

BUSINESS HOUSE CELEBRATES FIFTIETH ANNIVERSARY.—In the closing week of 1912 The Farbwerke-Hoechst Company celebrated the fiftieth anniversary of its establishment, and it is interesting to know that, from a small beginning, the concern has grown until, at the time of reaching the half century mark, it has twelve thousand people in its employ.

THE names of the following veterinarians are included in the membership of The Society of American Bacteriologists: J. W. Connaway, Columbia, Mo.; C. F. Dawson, Jacksonville, Fla.; P. C. Fitch, Ithaca, N. Y.; Ward Giltner, East Lansing, Mich.; John R. Mohler, Washington, D. C.; V. A. Moore, Ithaca, N. Y.; R. C. Reed, Newark, Del.; John Reichel, Glenolden, Pa.; E. C. Schroeder, Washington, D. C.; W. J. Taylor, Bozeman, Mon.; Leunis Van Es (Agricultural College), N. Dak., and A. R. Ward, Manila, P. I.

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION, NEW YORK CITY, DECEMBER MEETING.

The regular monthly meeting of this association was called to order by the Vice-President, Dr. R. H. Kingston, the President, Dr. Berns, being absent on account of illness.

The minutes of the October and November meetings were read and approved, also the minutes of the special meeting of November 18, 1912.

Dr. McLaughlin, chairman of the committee appointed to investigate the case of Mr. Benj. H. Mount, who was supposed to be infected with glanders, reported as follows:

Mr. Mount had his second finger of his right hand affected, said to be due to a cut received while dressing an abscess on a horse which was shortly afterward destroyed as a positive case of glanders.

This finger when seen by the committee was considerably swollen, the skin being white in appearance, thick and two slight openings, one at each end, from which pus issued very slightly. From one of the openings Dr. Schlesinger took two specimens to grow cultures.

About three inches above the wrist on the inside of the arm there was a pustule. This pustule was healing. Around the pustule and running around the arm was a discoloration of the skin. This discoloration was not present, according to Mr. Mount, until after he had been treated at the hospital, and appeared to be the result of some irritant application.

A rash extended over the arm in the shape of a great many small, brownish red colored spots.

There was no swelling in the arm, although it was stated that there had been a great deal of swelling.

The shoulder was complained of as being sore, and it looked somewhat larger than the other, but the soreness was explained to be due to the driving of an automobile, his sore finger causing the exercise of unused muscles in the shoulders.

The axillary gland was normal, but Mr. Mount said it had been swollen.

The left hand had a sore, which was thought to be due to some local irritation. This was on the index finger. On the wrist there was a pustule which was slightly moist but healing.

Mr. Mount said that the finger had caused him great pain, but now the pain was comparatively slight.

He assured the committee that he felt fine, and he appeared to be in perfect health. He also stated that he had been very much frightened, but now he had no fear.

The committee concluded that the patient did not exhibit any positive symptoms of glanders.

This report was on motion received.

Mr. Mount was then presented by Dr. C. L. Antony (M.D.), who had the dressings removed from the finger and the patient stripped to the waist. Dr. Antony stated that the lesions on the right hand have the appearance of a burn, but are not in a healing condition. Guinea pigs, inoculated, have developed no signs of glanders. Smears show nothing; no fever.

Dr. Schlesinger stated that guinea pigs, inoculated 3½ weeks ago, gave negative reactions.

Dr. Blair asked if blood specimens had been taken for the sera tests. Dr. Antony stated that up to the present time this had not been done.

The patient was examined by the members and visitors present with a great deal of interest.

Dr. Killilea (M.D.) examined this case and stated that he would recommend the use of mallein, and suggested that it would be an excellent thing if the patient could be placed in the Rockefeller Institute.

Dr. Moffitt Smith cited a case of human glanders, which was discharged from one of the local hospitals as cured, but in a short time suffered a relapse, was returned to the hospital and died.

Dr. H. D. Gill gave an interesting account of a case of glanders in a horse in which the temperature and respiration were abnormal. Reacted to the blood and mallein tests. Temperature reduced to 101° F.; discharge from nostril stopped. Week elapsed, and two typical farcy buds developed on the hock.

On post mortem extensive lesions were found. The doctor stated that invariably when glander lesions are found externally they will also be found internally.

Also cited another case in which post mortem was held, and

the condition of the lesions found indicated that healing was taking place and recovery would have probably resulted.

Dr. E. B. Ackerman also mentioned several interesting cases of glanders that he had come in contact with. Held post-mortem examinations on two cases that had external farcy lesions, but no visible internal lesions.

Dr. Ellis asked if a horse in which the glander lesions had healed was a safe animal to keep? It was the general opinion that such an animal would be safe.

Dr. McLaughlin cited a case of positive clinical glanders in a horse owned by a druggist which was cured and worked for years afterward.

The secretary mentioned three cases of glanders in human subjects which had come under his personal observation, all of which resulted fatally.

Dr. R. W. Gannett stated that six years ago he was supposed to be infected with glanders, but the sera tests proved negative, and symptoms and lesions cleared up.

Dr. Gill asked Dr. Killilea (M.D.) if in his opinion a human subject may be infected with glanders, and not show any positive symptoms, and if any symptoms are present if it is not possible that they may clear up.

Dr. Killilea said that without doubt local lesions may occur and clear up.

A general discussion of this subject then took place.

A unanimous vote of thanks was tendered Drs. Antony and Killilea.

A list of veterinarians which Chief Veterinarian J. G. Wills, of the Department of Agriculture, requested corrected was then read by the secretary and changes of addresses noted, also those known to be deceased.

Dr. R. W. Ellis, chairman of the committee on glanders resolutions, read the resolutions adopted by this association, and submitted to the Commissioner of Agriculture for his consideration.

This report was accepted and a vote of thanks extended to the committee.

This being the annual meeting, the reports of the officers and committees were then called for.

Dr. McKinney, chairman of the prosecuting committee, gave a brief account of the work done by this committee, and stated that he would render a detailed report of the finances at the next meeting.

The Secretary and Treasurer's report was on motion duly accepted.

The next order of business being the election of officers for the ensuing year, resulted as follows:

President, W. J. McKinney; Vice-President, R. H. Kingston; Secretary and Treasurer, R. S. MacKellar.

Dr. McKinney in his usual inimitable way thanked the association for the honor conferred in electing him President, and asked for the co-operation of every member during the coming year to make it a successful one.

No further business appearing, the meeting adjourned.

R. S. MACKELLAR, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY, JANUARY MEETING.

The regular monthly meeting of this association was called to order by President-elect McKinney, January 8, 1913, at 8.45 p. m.

The minutes of the December meeting were read and approved.

Dr. McKinney, chairman of the prosecuting committee for 1912, reported a balance of \$243.95 in the prosecuting fund.

The president then made a few pleasing and appropriate remarks eulogizing the veterinary profession; also strongly advocated the use of anæsthetics in both major and minor operations.

The following appointments were then announced:

Board of Censors—Dr. D. W. Cochran, chairman; Dr. C. E. Clayton, Dr. J. E. Crawford, Dr. H. D. Gill and Dr. W. Reid Blair.

Judiciary Committee—Dr. R. H. Kingston, chairman; Dr. D. J. Mangan and Dr. P. Burns.

Prosecuting Committee—Dr. Charles Jamieson, chairman; Dr. Moffitt Smith and Dr. L. Griessman.

Dr. John A. McLaughlin, of New York City, then read a paper entitled "Outlines of a New Physiology." This paper was productive of quite an animated discussion, in which some of the members expressed themselves as directly opposed to the theories advanced by the essayist.

On motion regularly made, seconded and carried, the discussion of this paper was discontinued.

Dr. R. W. Gannett, of Brooklyn, N. Y., then read an interesting paper on "Fistulous Withers and Poll Evil." The doctor cited several cases where extensive operations had given very good results after other treatments had failed.

Dr. Ryder, in discussing this subject, mentioned a black mare which had a cicatrix of at least three years' standing on one side of the neck. A fluctuating fistulous swelling appeared on the other side, which was opened freely, and auto-therapy treatment used with good results.

Dr. Mangan stated that he has had remarkably good results with auto-therapy in the initial stages of these conditions, and considers it almost specific where no necrosed bone or dead tissue act as a foreign body, necessitating surgical interference.

Dr. Cochran mentioned having a case in which he trephined the scapula to drain a pus-pocket which had formed behind that bone.

Dr. Chase gave the history of two cases which he had treated by auto-therapy, resulting in a cure in about three months.

Dr. Mangan also stated that the interest in auto-therapy was wide spread, as he had received inquiries regarding the same from as far away as Australia.

Dr. P. K. Nichols stated that he was making some experiments along this line in the treatment of hog cholera, but had not progressed far enough to make any definite statement as to its efficiency as yet, but was inclined to believe that some benefit had been derived from its use.

Dr. C. C. Cattanaach, owing to having permanently located on the Jersey coast, and being unable to attend the meetings, tendered his resignation, which was regretfully accepted.

It was regularly moved, seconded and carried that the discussion of Dr. McLaughlin's paper be continued at the next meeting.

It was also on motion unanimously decided to hold a "smoker" in the near future, and the following committee was appointed, with full power to make arrangements for the same: R. S. MacKellar, chairman; Moffitt Smith and C. G. Roher.

Dr. Moffitt Smith stated that it was reported that Benj. Mount had developed a positive case of glanders.

Dr. R. W. Ellis reported that he had received the good news from Dr. Hoskins that the Army Bill had passed the House, and urged that every veterinarian exert himself to the utmost to have the Senate take similar action. Dr. Ellis asked President McKinney, who was to leave on the midnight train for Ithaca for

the State conference, to bring the Army Bill before the veterinarians of the State and get them into action.

On motion, which was unanimously carried, the secretary was instructed to write Senators Root and O'Gorman in the name of this association, urging them to support this measure.

Several members promised to contribute to the program of the February meeting.

There were over forty members and visitors present.

Meeting adjourned.

R. S. MACKELLAR, Secretary.

RESOLUTIONS ADOPTED BY THE IOWA VETERINARY ASSOCIATION, IN SESSION AT AMES, NOVEMBER, 1912.

The following resolutions were unanimously adopted at the Twenty-fifth Annual Meeting of the Iowa Veterinary Association:

At this twenty-fifth anniversary annual meeting we congratulate ourselves on the phenomenal growth, influence and standing of this association, whose members past and present are now filling a large number of the most important positions in the veterinary world.

We greet with pride the charter members present, chief of whom is our President, Dr. E. E. Sayers, and we sincerely hope these charter members present to-day may continue to meet with us during the coming annual conventions until we meet twenty-five years hence to celebrate the golden anniversary of our beloved association.

At this meeting, held in the newly erected Veterinary building, we congratulate the veterinary faculty and students on the fact that they are now being cared for in the best built and finest equipped veterinary college in America, and we, the members of this association, pledge to the educational board of control and the veterinary faculty our heartiest support for the coming years in the securing of larger classes than heretofore known in this, our department, of the great Iowa State Agricultural College.

We compliment the ladies of the Department of Domestic Science on their display of floral decorations in the magnificent "Mound of Beauty" centerpiece, and the table decorations of the numerous varieties of Ames chrysanthemums, more beautiful than any ever imported from the "land of the setting sun," and

we tender to these ladies our sincerest thanks for the best banquet menu ever prepared and served for this association at its annual convention, and recognizing the important place the Department of Domestic Science occupies in this great industrial school in the training of our girls in the art of housekeeping and home-making, we unanimously oppose the removal of this department from Ames, and most earnestly request of the State Educational Board that they reconsider and rescind their recommendation suggesting its removal to Iowa City.

To the members of the Des Moines Male Quartet we tender our thanks for their well-rendered selections, which added much to the enjoyment of the evening after the banquet.

To the associated faculties of the Iowa State College and the business men of the city of Ames, we tender our most hearty thanks for the magnificent welcome accorded this association and the splendid banquet given by them, and to the fraternities and the people of Ames for their hospitality and splendid entertainment of our members during their sojourn here.

To the ladies of the faculty we are deeply grateful for the beautiful manner in which they entertained our wives at luncheon and during our stay in the city, which more than anything else insures our return to Ames for future conventions.

We congratulate the veterinary faculty and students on their success in securing the material and conducting one of the best and most instructive clinics ever held during an annual convention.

(Signed.)

Dr. J. I. GIBSON,
Dr. S. H. BAUMAN,
Dr. L. U. SHIPLEY,
Committee on Resolutions.

FURTHER RESOLUTIONS ADOPTED BY THE IOWA VETERINARY ASSOCIATION.

Whereas, The livestock interests of Iowa are subject to great losses because of infective diseases; and,

Whereas, The losses from these diseases may be restrained, prevented and the diseases even eradicated by the intelligent use of biologic laboratory products, such as vaccine, bacterins, serums and antitoxins; and,

Whereas, Such biologic products are manufactured or produced and sold to the people of Iowa by individuals, companies and corporations located in all parts of the United States and in other countries; and,

Whereas, These biologic products have not proven uniformly dependable and ofttimes have served to spread disease through ignorance, negligence, or mercenary unscrupulousness of some producers; therefore, be it

Resolved, That we, the members of the Iowa Veterinary Association, urge upon Congress the necessity of making provision for federal inspection of all plants engaged in the manufacture of Veterinary biologic products offering such products for interstate trade, and forbidding such trade excepting where the product shall equal a standard of quality to be established by the government, and that the standardization, inspection and licensing shall be made the duty of the Bureau of Animal Industry, Department of Agriculture; and be it further

Resolved, That we request the United States senators and members of the United States House of Representatives from Iowa to give the matter particular attention in behalf of the livestock interests of Iowa.

C. H. STANGE, Secretary.

INDIANA VETERINARY MEDICAL ASSOCIATION.

The seventeenth annual meeting of the association convened at ten o'clock, January 15, at The Denison Hotel, Indianapolis. The following officers were elected for the year 1913: President, J. G. Heighway, of Ladoga; vice-president, W. B. Carter, of Covington; secretary, A. F. Nelson, of Lebanon, and treasurer, J. W. Klotz, of Noblesville.

Resolutions were passed opposing an internal revenue tax on veterinarians for the dispensing of cocaine, opium and its alkaloids, etc., and also the recording of each case in which they are used, as proposed in a bill now before the House of Representatives of the present session of Congress, the resolutions setting forth that, so far as we know, no graduate veterinarians are engaged in the practice of dispensing habit forming drugs, and that to keep a record of each case would work an unnecessary hardship on the busy practitioner, especially those that are humanely inclined, and use local anæsthesia for minor operations. The following papers were read and discussed: "Pyæmic

Arthritis," by Dr. T. A. Sigler. Dr. Sigler's paper, though an excellent one, failed to elicit much discussion, probably from the fact that the next paper was on the same subject. "Pyo-Septicæmia of Sucklings," J. C. McDaniel. This was another good paper and was fairly well discussed; each of these papers covered the ground so well that there was not much left to discuss. "Horse Doctoring As It Was," C. I. Fleming. This being a subject so much different from those generally discussed, and the author in his reminiscences picturing the past so vivid to us, left no opening for a discussion. "Report on Vaccination of the Hog," J. H. Mills. This was to be a case report but as the doctor, after looking over the record of herds vaccinated, found that he had vaccinated 219 herds, it was impossible for him to get his report ready for the meeting. As is usual, vaccination was thoroughly discussed, and from the discussion the usual good, bad and sometimes unlooked-for results were reported. "Autogenous Vaccines," Geo. H. Roberts. The author described in full his methods of making and administering the various autogenous products. There was a liberal discussion and question asking on this paper, bringing into prominence one of the most potent factors in treating bacterial infection, and no doubt arousing in the minds of most of those present the sound logic of autotherapy. "Parturient Paresis," H. A. Miller. Another excellent paper, well handled by the author, and incidentally bringing out many theories as to the etiology of the disease.

On Thursday, January 16, at 9 a. m., the association met at the Indiana Veterinary College for clinics, Dr. J. W. Klotz in charge. There were various interesting operations, among them being the removal of a tumor of the mammary gland of a mare, this tumor weighing about twenty pounds and being the third one removed; the two previous, were removed at periods of six and three months intervals. Operators, A. B. Carte and R. C. Applegate. "Demonstration of Vaccination of the Hog." J. H. Mills did the injecting of the animals, assisted by various others. "Operation on Perineum of Mare." This operation was done by Dr. J. W. Klotz and others, the doctor demonstrating to those present his method fully for this operation. "Poll Evil Operation," consisting of the resection of the ligamentum nuchæ; operators, Drs. Geo. H. Roberts and W. J. Armour. There were various other operations; in fact, the clinics lasted all day, giving those late in arriving plenty to entertain them.

A meeting was called at 1.30 p. m. in the senior class room for the purpose of receiving the report of the outstanding com-

mittees, and at this session four new members were submitted, making in all a total of 26 new members at this meeting, which is not so bad when you consider that we had the A. V. M. A. meeting this year, and as the "boys" were all in attendance at it we would naturally suppose it took some of their reserve fund.

The Necrology Committee reported the deaths of E. H. Pritchard and Fielden Lett, Jr., and resolutions of condolence to the families of each were adopted.

A Legislative Committee of nine members (one from each Congress District) was appointed to look after proposed legislation, both state and national, detrimental to the veterinary profession.

Notwithstanding the inclement weather, the seventeenth annual meeting was a decided success, and demonstrates that the veterinarians of Indiana are alive, and anxious to co-operate with each other in any manner that may lead to the advancement of the profession.

A. F. NELSON, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting of the above association was held on the evening of January the fourteenth in Donaldson's Hall, Philadelphia, with President Yunker in the chair.

The essayist for the evening was Dr. M. Dorset, of Washington, D. C., the topic presented was the "Differentiation of Hog Cholera and Swine Plague," which was delivered in a most interesting way and deeply appreciated by every one present. Dr. Dorset said that in most all of the outbreaks described as a pulmonary affection among hogs they invariably were proven to be hog cholera. Also that he believed that this disease can be safely controlled by the use of the serum and virus, and that its dispensation should be under the control of the state government. That in order to get the best results hogs should be inoculated in the early stage of the disease.

It was the consensus of opinion that the serum was of little value in animals whose temperatures were above 104 at the time of inoculation. Dr. Reichel thought that when it got that high that it was due to the secondary invaders. Dr. C. J. Marshall reported that they were getting very good results throughout the state with the use of the serum.

Dr. W. H. Hoskins reported the passage of the Army Bill through the House and urged the members to get after their Senators as there would be a hearing before the Senate Military Committee soon.

Several members reported favorably on the use of Equinalintz, both as a curative and prophylactically.

Dr. C. J. Marshall offered a motion seconded by Dr. W. L. Rhoads to send night letters to Senators Penrose and DuPont from the association telling them that the association urged their support in the passage of the Army Bill.

CHESTER M. HOSKINS,
Secretary.

NATIONAL COUNCIL ALPHA PSI FRATERNITY.

The third biennial convention of the Alpha Psi Fraternity was held at Philadelphia, November 29 and 30, 1912. The visiting delegates and national officers were the guests of the Epsilon Chapter of the University of Pennsylvania. The national officers in attendance were: Dr. H. E. Kingman, President, of Fort Collins, Col.; Dr. A. M. Jansen, Treasurer, of Columbus, Ohio, and Dr. H. Preston Hoskins, Secretary, of St. Paul, Minn. Alpha Chapter was represented by Mr. J. C. Schoenlaub, of Marion, Ohio; Beta, by Mr. A. Cameron Goff, of Caniester, N. Y.; Gamma, by Mr. R. S. Gerard, of Chicago, Ill.; Delta, by Mr. George W. Brower, of Cheyenne, Wyo.; Epsilon, by Mr. John T. E. Dinwoodie, of Bottineau, N. D., and Theta, by Mr. J. Isaac Handley, of Linesville, Ala.

The business meetings occupied the greater part of both days. Those who arrived on the 28th were taken to the Cornell-Pennsylvania football game in the afternoon. On the evening of the 29th the visitors were given a theatre party at the Garrick Theatre, and the usual banquet was held at the Majestic Hotel on the evening of the 30th.

The election of national officers resulted as follows: President, Dr. H. E. Kingman, of Fort Collins, Col.; Vice-President, Dr. E. S. D. Merchant, of Glen Cove, N. Y.; Secretary, Dr. H. Preston Hoskins, of St. Paul, Minn.; Treasurer, Dr. G. L. Drury, of Cherry Valley, Mass.

The next convention will be held in 1914 at Cornell.

H. PRESTON HOSKINS, Secretary.

SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE.

The above society has held its semi-monthly meetings during the semester. On November 8, 1912, Dr. D. H. Udall gave a very interesting talk on his visit to the continent. Dr. Udall visited all the larger veterinary colleges, among which were those at Berne, Munich, Vienna, Budapest, Hanover and Copenhagen; the larger part of his stay being with Dr. Hess at Berne.

On November 22, Dr. V. A. Moore spoke on the work of Pasteur. Dr. Moore, as usual, held the close attention of the student body.

The last meeting, held December 6, was addressed by Dr. C. E. Clayton, of New York City. Dr. Clayton gave a practical talk on "The Work of the Field Veterinarian." This talk filled a vacant place and was heartily enjoyed.

D. W. CLARK,
Corresponding Secretary.

THE FIFTH ANNUAL CONFERENCE FOR VETERINARIANS, held at the New York State College, Ithaca, N. Y., January 9 and 10, was the largest yet held. Prof. W. L. Williams' paper on "Diseases of the Internal Generative Organs in Relation to Dairy Inspection," was very instructive. The doctor showed his audience a specimen of a diseased uterus, from which pus had been discharging through the vagina, collecting and drying on the hindquarters and tail, scales from which were falling into the milk pail during milking. Dr. Phyfe's paper on "Dairy Inspection" was also very instructive, covering proper sanitation, concrete floors, etc. The doctor advised clipping the hindquarters of cattle and bedding them. The discussion which followed dealt fully with a clean milk supply. Following the address of welcome extended by Dean Hull, of the Department of Arts and Sciences, in the evening of the first day, Prof. B. Kingsbury, M.D., Ph.D., of the Department of Histology and Embryology, gave an illustrated lecture on "The Determination of Sex in the Offspring," explaining that this problem has been discussed for over two thousand years. The professor showed a series of embryology specimens. The rest of the evening was given over to relaxation in the form of a "smoker." The following day was filled with interesting papers, discussions and a clinic. Dr. Frank H. Miller gave a talk on anæsthesia as a factor in the

advancement of the veterinary profession, which was discussed by Drs. Williams and Law. Dr. Adams, of Philadelphia, gave a very interesting and instructive lecture on surgery. This was followed by an address by Dr. White, of Cornell University, who was in turn succeeded by Dr. Augustus S. Downing, First Assistant Commissioner of Education, who discussed the educational law as it now stands. At the clinic, Dr. Williams removed a thickened septum due to a fracture of the nasal bone, and operated on a case of osteomyelitis due to a diseased tooth. Dr. Frank H. Miller had a canine diagnostic clinic, and also did an oophorectomy on a collie bitch. In the evening of the second day the Society of Comparative Medicine of the New York State Veterinary College held a banquet, to which the veterinarians attending the conference were invited.

NOTE—We are indebted to Dr. David W. Cochran for notes from which this brief report was written.

SOCIETY OF AMERICAN BACTERIOLOGISTS MEET IN NEW YORK.—This society held its annual meeting in New York City, December 31, 1912; January 1 and 2, 1913. All-day sessions were held in the University and Bellevue Hospital Medical College, American Museum of Natural History and Rockefeller Institute for Medical Research.

The society aims to include in its membership any one who may appreciate the purpose of the society: "That, while the purpose of this society is primarily for the advancement of microbiology as a pure science, this must not be interpreted as excluding papers of applied microbiology which involve fundamental microbiological laws and technical principles, or which embody important discoveries.

The following veterinarians attended at least a part of the three day sessions: J. R. Mohler, Washington, D. C.; E. W. Mumma, Glenolden, Pa.; M. J. Harkins, Glenolden, Pa.; E. Records, Glenolden, Pa.; V. A. Moore, Ithaca, N. Y.; C. P. Fitch, Ithaca, N. Y.; R. C. Reed, Newark, Del.; Ward Giltner, East Lansing, Mich., and John Reichel, Glenolden, Pa.

"Studies on the Etiology of Hog Cholera," by Walter E. King and F. W. Baeslack, Detroit, Mich., and the paper read under the title of "The Production of Peptotoxins by the Bacillus of Contagious Abortion," by John Reichel and M. J. Harkins, Glenolden, Pa., were of considerable interest to veterinarians.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alabama Veterinary Med. Ass'n.	August, 1913....	Auburn.....	C. A. Cary, Auburn.
Alumni Ass'n. N. Y.-A. V. C.		141 W. 54th St.	J. F. Carey, East Orange, N. J.
American V. M. Ass'n.	Sept. 1-2-3-4-5 '13.	New York, N. Y.	C. J. Marshall, Philadelphia.
Arkansas Veterinary Ass'n.			J. B. Arthur, Russellville.
Ass'n Médécalle Veterinaire Française "Laval"	1st and 3d Thur. of each month	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.	2d Fri. ea. mo.	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.	3d Mon. ea. mo.	S. Omaha, Neb	E. J. Jackson, So. Omaha.
California State V. M. Ass'n.	Dec. 11, 1912....	San Francisco	John F. McKenna, Fresno.
Central Canada V. Ass'n.		Ottawa.....	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n.	June and Nov.	Syracuse.....	W. B. Switzer, Oswego.
Chicago Veterinary Society.	2d Tues. ea. mo	Chicago.....	D. M. Campbell Chicago.
Colorado State V. M. Ass'n.	Jan., 1913.....	Denver.....	B. F. Kaupp, Ft. Collins.
Connecticut V. M. Ass'n.	Feb. 4, 1913....	Hartford.....	B. K. Dow, Willimantic.
Delaware State Vet. Society.	Jan. Apl. Jy. Oct.	Wilmington...	A. S. Houchin, Newark, Del.
Essex Co. (N. J.) V. M. A.	3d Mon. ea. mo.	Newark, N. J.	J. F. Carey, East Orange, N. J.
Genesee Valley V. M. Ass'n.			J. H. Taylor, Henrietta.
Georgia State V. M. A.		Atlanta.....	P. F. Bahnsen, Americus.
V. M. A. of Geo. Wash. Un'y.	2d Sat. ea. mo.	Wash., D. C.	A. T. Ayers.
Hamilton Co. (Ohio) V. A.			Louis P. Cook, Cincinnati.
Idaho Ass'n of Vet. Graduates.		Boise.....	G. E. Noble, Boise.
Illinois State V. M. Ass'n.	Dec. 5-6, 1912.	Chicago.....	L. A. Merillat, Chicago.
Indiana Veterinary Association.	Jan. 15-16, 1913.	Indianapolis...	A. F. Nelson, Lebanon.
Iowa Veterinary Ass'n.	Nov. 12-13-14 '12	Ames.....	C. H. Stange, Ames.
Kansas State V. M. Ass'n.	January 7-8, 1913	Topeka.....	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.	Oct. & Feb. ea. yr.	Lexington...	Robert Graham, Lexington.
Keystone V. M. Ass'n.			E. H. Yunker, Phila.
Lake Erie V. M. Association.	Oct. 8-12, 1912.	Lorain, O.	Phil. H. Fultow, Norwalk, O.
Louisiana State V. M. Ass'n.			E. P. Flower, Baton Rouge.
Maine Vet. Med. Ass'n.	Jan., 1913.....	Augusta.....	C. W. Watson, Brunswick.
Maryland State Vet. Society.		Baltimore....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.	4th Wed. ea. mo.	Young's Bost'n	J. H. Seale, Salem.
Michigan State V. M. Ass'n.	Feb. 4-5, 1913...	Lansing.....	W. A. Ewalt, Mt. Clemens.
Minnesota State V. M. Ass'n.	July 10-11, 1912.	Minneapolis...	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.			Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.	Jan. 21-22-23, '13.	Kansas City...	Hal. C. Simpson, Denison, Ia.
Missouri Vet. Med. Ass'n.	July, 1913.....	Kirksville....	S. Stewart, Kansas City.
Montana State V. M. A.	Jan. 1913.....	Bozeman.....	A. D. Knowles, Livingston.
Nebraska V. M. Ass'n.	January, 1912...	Lincoln.....	W. H. Tuck, Weeping Water.
New York S. V. M. Soc'y.	Jy. 30-31, Aug. 1.	Utica.....	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.	June, 1913.....	Salisbury....	M. J. Ragland, Salisbury.
North Dakota V. M. Ass'n.	Jan. 22-23, 1913.	Fargo.....	C. H. Babcock, New Rockford.
North-Western Ohio V. M. A.	Feb. and Nov...	Lima.....	A. J. Kline, Wauseon.
Ohio State V. M. Ass'n.	Jan. 8-9, 1913...	Columbus....	Reuben Hilty, Toledo.
Ohio Soc. of Comparative Med.	Annually.....	Up'r Sandusky	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.			J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.	Dec. 14-15, 1911.	Okla. City....	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.	April, 1912.....	Toronto.....	C. H. Sweetapple, Toronto.
Pennsylvania State V. M. A.	Jan. 21-22, 1913.	Harrisburg...	John Reichel, Glendon.
Philippine V. M. A.	Call of President	Manila.....	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.	4th Tues. ea. mo.	Portland, Ore.	Sam. B. Foster, Portland, Ore.
Province of Quebec V. M. A.		Mon. and Que.	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.	Jan. and June...	Providence...	J. S. Pollard, Providence.
South Carolina Ass'n of Veter'ns			Clarence E. Smith, Greenville.
So. Illinois V. M. and Surg. A.	Jan. 2-3, 1912...	Centralia.....	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors.	1st Wed. fol. the 2d Sun. ea. mo.	St. Louis.....	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.	Dec. 18, 1912...	Reading.....	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.		Philadelphia..	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.	2d Tues. July '12	Aberdeen....	S. W. Allen, Watertown.
Southern Auxiliary of California State V. M. Ass'n.	Jan. Apl. Jy. Oct.	Los Angeles..	J. A. Dell, Los Angeles.
So. St. Joseph Ass'n of Vet. Insp.	4th Tues. ea. mo.	407 Ill. Ave...	H. R. Collins, So. St. Joseph.
Tennessee Vet. Med. Ass'n.			A. C. Topmiller, Murfreesboro.
Texas V. M. Ass'n.	Mar. 18 19, 1912.	Fort Worth...	R. P. Marsteller, College Sta.
Twin City V. M. Ass'n.	2d Thu. ea. mo.	St. P.-Minneap	S. H. Ward, St. Paul, Minn.
Utah Vet. Med. Ass'n.	Mar., 1912.....	Logan.....	A. J. Webb, Layton.
Vermont Vet. Med. Ass'n.			G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta.			C. H. H. Sweetapple, For.
Vet. Ass'n Dist. of Columbia.	3d Wed. ea. mo.	514-6th St., N. W.	Saskatchewan, Alta., Can.
Vet. Ass'n of Manitoba.			M. Page Smith, Wash., D. C.
Vet. Med. Ass'n of N. J.	Midsummer Fair Jan. 1913.....	Winnipeg.....	F. Torrance, Winnipeg.
V. M. Ass'n, New York City.	1st Wed. ea. mo.	Jersey City...	E. L. Loblein, New Brunswick.
Veterinary Practitioners' Club.	Monthly.....	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Virginia State V. M. Ass'n.	July 11, 1912...	Jersey City...	A. F. Mount, Jersey City.
Washington State Col. V. M. A.	1st & 3d Fri. Eve.	Newport News	Geo. C. Faville, Norfolk.
Washington State V. M. A.	Jan. 9-10, 1913.	Pullman.....	R. J. Donohue, Pullman.
Western Penn. V. M. Ass'n.	3d Thur. ea. mo.	Wenatchee....	Carl Cozier, Bellingham.
Wisconsin Soc. Vet. Grad.	July, 1912.....	Pittsburgh....	Benjamin Gunner, Sewickley.
York Co. (Pa.) V. M. A.	June 4, 1912...	Janesville....	J. P. West, Madison.
		York.....	E. S. Bausticker, York, Pa.

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